

CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

COVER STORY:

RE-ENGINEERING BUSINESS PROCESSES

SHORING UP THE NATION'S SCHOOLS

DECEMBER 1990

VOLUME FOUR NUMBER THREE

SEVEN DOLLARS

For a world
in which the
only thing permanent
is change.

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Production Systems.



It used to be a giant mainframe was your only choice for running the computing applications vital to your company's day-to-day business.

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CIO

VOLUME 4, NUMBER 3

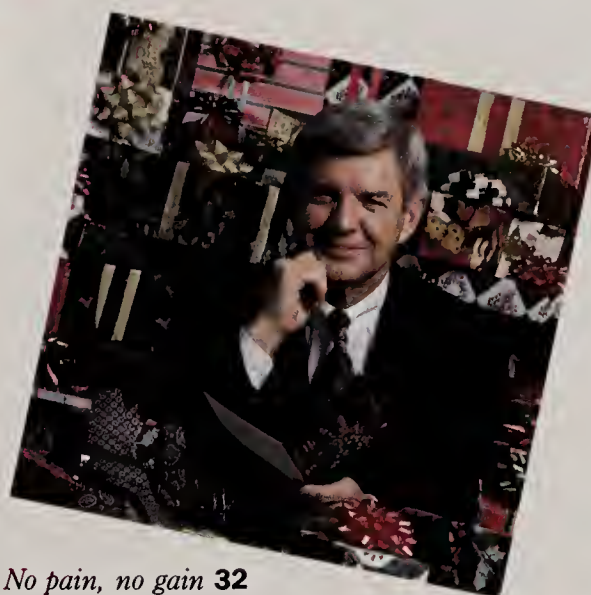
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The Corporate Make-Over

Companies faced with the need to overhaul outdated business processes are turning to business re-engineering, a methodical technique for identifying and enhancing the essential while paring away the obsolete.

By Allan E. Alter

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Cover photo by Neil MacDonald*

FEATURES

The Technology Trackers

The Office of Technology Assessment does for the U.S. Congress what some say a good CIO does for executive management: presents complex technology options in plain language and within relevant contexts.

By David Freedman

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Extra Credit

Part philanthropy and part prudent investment in the future, businesses are pitching in to help schools confront the worsening educational climate.

By Meghan O'Leary

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Bringing IT All Back Home

Decentralization of information technology has worked wonders for organizations in the past 20 years. Here's how one major financial institution has worked even more wonders by reversing that trend.

By David Freedman

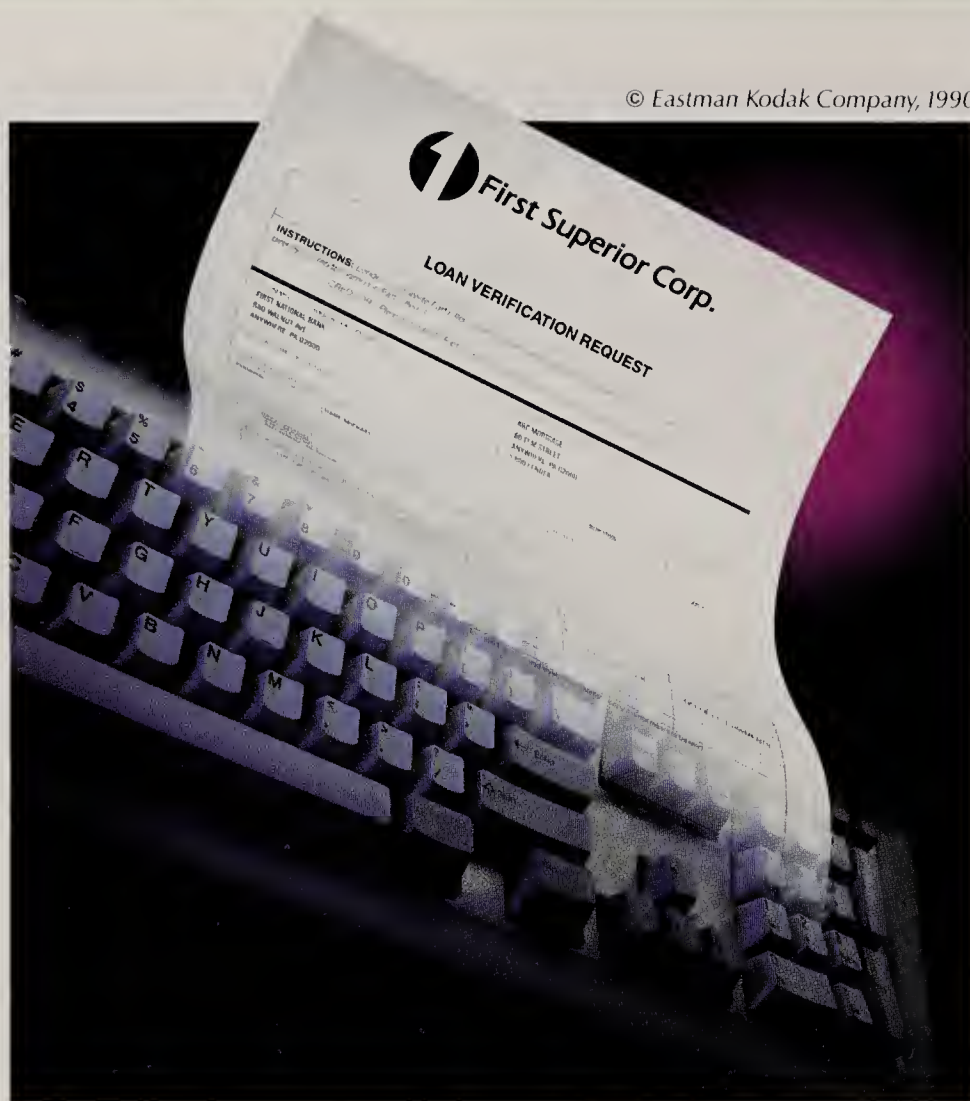
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M O R E ► ► ►

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Companies with hands-on experience using expert systems have learned that the technology keeps its promises—as long as it's put to work solving the right problems in the right way.

By Paul Konstadt

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INSIGHTS: TOWARD ASSET-BASED I.T.

A recent survey shows that while companies may say they value IT as a strategic asset, their budgeting and investment-justification practices still treat it as an expense.

By Anthony P. DiRomualdo

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OUTLOOK: ORGANIZATIONAL REVISIONISM

Re-engineering the company's business procedures is the preeminent concern of CIOs, according to a recent survey of IS priorities.

By James Champy

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The chief executive confronting a troubled IS function might do well to think twice before conducting a purge.

By William N. Harris and Susan K. Behnke

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The IEF™ can help you develop unprecedented quality, prod



"The IEF is a superior tool for implementing Information Engineering because it integrates the entire process from planning through code generation. We're deploying the IEF throughout the corporation."

David V. Evans
Vice President
Director, Information Systems
J.C. Penney



"Our On-line Banking system has been in production for more than 12 months—500,000 transactions a day—without a single code failure. And we had very few enhancements to do. Our users got what they needed the first time out."

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Huntington National Bank



"To meet the dramatically reduced time-to-market requirements for our products, we need high-quality systems that can be changed fast. That's why we've chosen the IEF as the CASE solution for our entire organization."

John Pajak
Executive Vice President
Mass Mutual Life Insurance



"The strengths of the IEF are clear-cut. One obvious quality advantage is that application changes are made to diagrams, not code. This ensures ongoing integrity—the specification always matches the executing system."

Paul R. Hessinger
Chief Technology Officer
Computer Task Group



"I've seen other CASE tools fail, so I raised the bar high when we evaluated the IEF. It passed with flying colors. I could not be happier with my decision to adopt the IEF company-wide."

John F. Mott
President
AMR Travel Services



"Our users were extremely pleased when we finished our first project—a 60-transaction system—in one-half the budgeted time. We had tried interfaced CASE tools without success. IEF integration makes the difference."

Giorgio Sorani
Division Head - MIS
Lubrizol



"We are using the IEF to develop a new generation of manufacturing systems replacing over 300 existing systems. We estimate that IEF will increase our productivity by between 2-to-1 and 3-to-1 for new systems development."

Wal Budzynski
Head of Operations, Systems/Computing
Rolls-Royce



"We used the IEF to rebuild our aging Frequent Flight Bonus system. With DB2 tables of up to 52 million rows, we needed high performance. And we got it...98% of our transactions complete in less than 3 seconds."

Cloene Goldsborough
Director of Data Resource Management
TWA



"Our first IEF system was completed faster, and with fewer errors, than any system I've ever seen. If I had to go back to the old ways, I'd find another job...outside the DP world. It means that much to me."

Mogens Sorensen
Chief Consultant
Nykredit (Denmark)

Open information systems with productivity and maintainability.

The success of Texas Instruments CASE product is proven—in the field.

Major companies have used TI's CASE product, the Information Engineering Facility™ (IEF™), for everything from rebuilding aging high-maintenance-cost systems to development of new enterprise-wide strategic systems.

Study shows zero code defects.

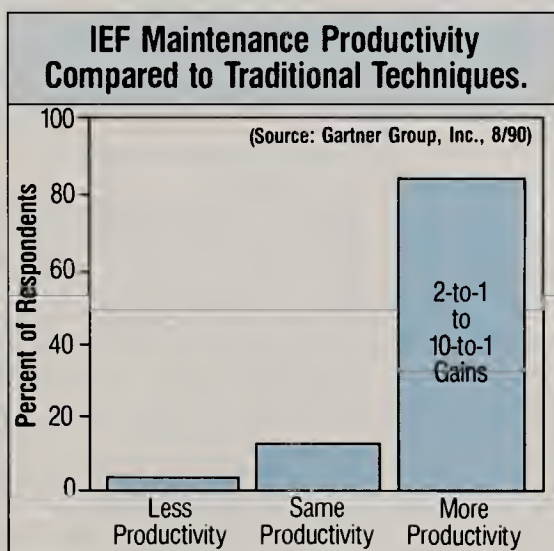
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) IEF developers reported zero defects—not one abend had occurred in IEF-generated code.

Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, more than 80 percent had experienced gains of from 2-to-1 to 10-to-1. (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

Mainframe applications can be developed and tested on a PC.

With our new OS/2 toolset, you can develop mainframe applications, from analysis through automatic code generation, on your PC. Then, using the IEF's TP monitor simulator and the diagram-level testing feature, you can also test these mainframe applications without ever leaving the PC.

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The IEF has generated applications for IBM mainframe environments (MVS/DB2 under TSO, IMS/DC, and CICS) since early 1988. Soon you'll be able to develop systems in OS/2 and then automatically generate for other platforms. DEC/VMS, TANDEM and UNIX are scheduled for availability in 1991. More will

follow. We are committed to increased environmental independence in support of the Open Systems concept.

We are committed to standards.

IEF tools and IEF-generated code will comply with standards as they emerge. We will adhere to CUA standards and to the principles of IBM's AD/Cycle and DEC's Cohesion—and we will support Open Systems environments centering around UNIX. In any environment, the COBOL, C and SQL we generate adhere closely to ANSI standards. Our presence on standards committees helps us keep abreast of ANSI and ISO developments affecting the CASE world.

Full-service support.

Of course, our technical support, consultancy, training courses, satellite seminars, and other informational assistance will continue apace. We also offer re-engineering and template services. This full-service support will remain an integral part of the IEF product.

For more information, including a VHS video demo, call 800-527-3500 or 214-575-4404.

Or write Texas Instruments, 6550 Chase Oaks Blvd., Plano, Texas 75023.

TEXAS 
INSTRUMENTS

For the second year in a row, re-engineering business processes is the number-one concern of information executives, according to the Index Group's annual survey of critical issues. But just what does the re-engineering process involve, and how do CIOs participate in it? To answer those and other questions, Special Projects Editor Allan E. Alter interviewed companies in various phases of re-engineering.

One lesson that came across loud and clear was that re-engineering is an enterprisewide activity that has to be inaugurated by top management and must involve executives from all facets of the organization's operation—including information systems. Great opportunity exists for information executives to catalyze the process and to provide the repository of expertise to help executives achieve the re-engineering imperative. Over the next several months, we will report on various approaches to the re-engineering effort.

The increasing prominence of information management in organizations is the reason for the success of *CIO*. Since we started publication a little more than three years ago, our editorial team has grown from two to 13 individuals (pictured below) and a cadre of regular freelancers. *CIO* is dedicated to bringing our readers a high-quality magazine infused with ideas on the latest trends in information management. We appreciate your support of our product and wish you a happy holiday season and a successful new year.

Marcia Blumenthal



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Judging By Other CASE Products, 80% Of Your Workload Doesn't Exist.

Most CASE products only scratch the surface of your development problems.

That's because they're designed exclusively for developing new systems. But when it comes to maintaining older systems—the biggest chunk of your workload—most CASE tools leave you out in the cold.

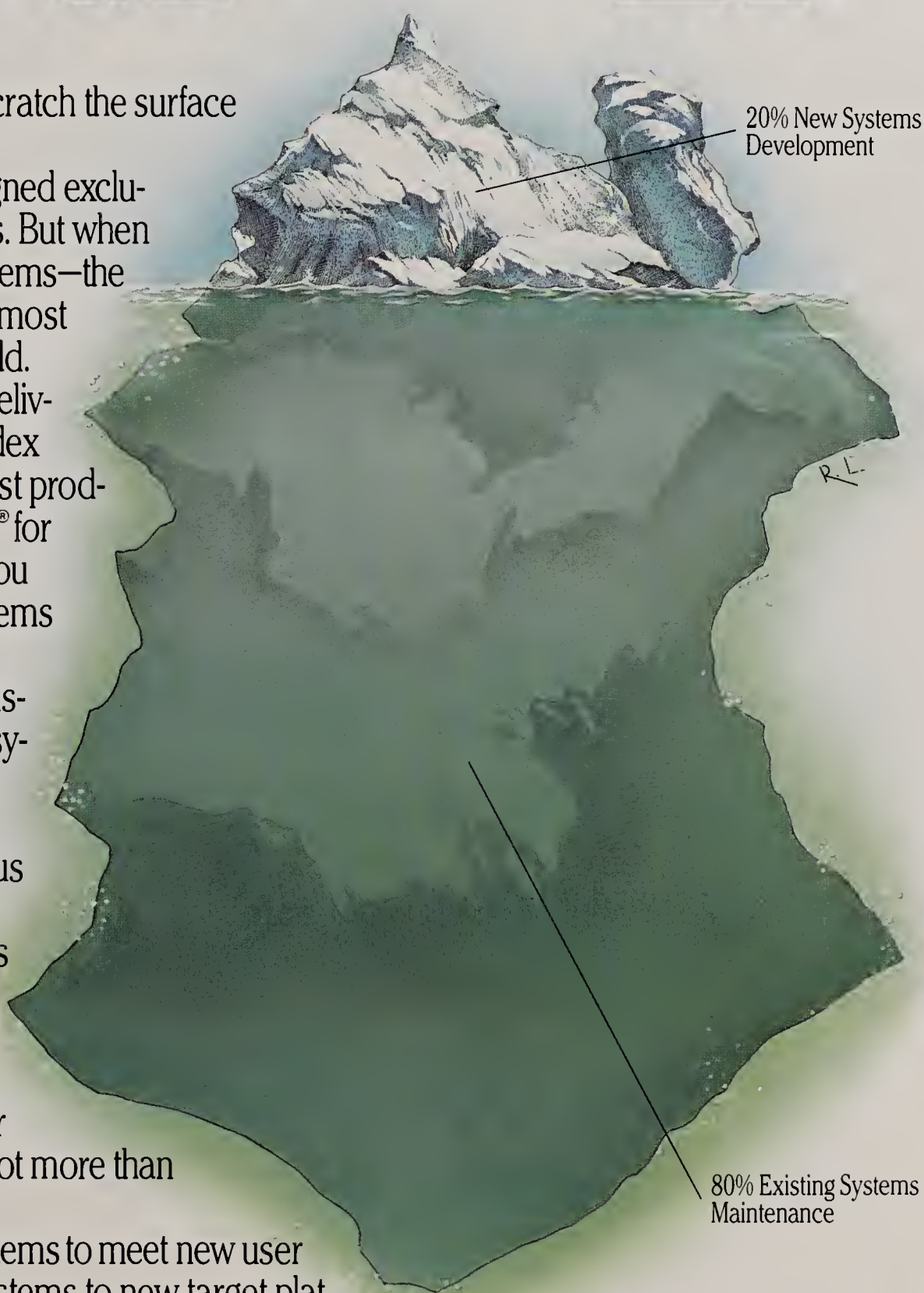
Fortunately, one company delivers a complete CASE solution: Index Technology Corporation. Our latest product offering,  Excelerator[®] for Design Recovery, lets you bring your existing systems into the CASE environment.

This innovative product translates complex code into clear, easy-to-understand diagrams. It scans COBOL data and procedure divisions, IMS database definitions, plus  IMS/MFS and CICS/BMS screen maps—and captures their underlying structures in a CASE repository.

With Design Recovery and the other powerful products in our Excelerator Series, you can do a lot more than just develop new systems.

You can also modify old systems to meet new user requirements, migrate existing systems to new target platforms, or even adapt old systems to support new business goals. All of which means you won't have to scuttle your current investments to keep pace with your changing needs.

For more about our complete CASE solution, call us today at 1-800-777-8858—before the biggest part of your workload takes you under.  There's No Substitute For Experience.



"... Similar computer technologies can lead either to monumental successes or dismal failures. Only Management value-added, with or without computers, will tell you if computers produce a business payoff."

Paul A. Strassmann
Strassmann Inc.



While all companies are attempting to measure the ROI of their expenditures on information resources, the fact is that different companies, with different approaches to information technology, experience different profitability benefits.

As Paul Strassmann's metric, called ROM (Return on Management), implies, it is the management application of computers, not the technology itself, that determines the real business value of computers.

In other words, executives must know how to invest in information resources—and how to extract maximum value from those investments. Then, and only then, can organizations accomplish the primary goal of using IT to increase efficiency, boost productivity and maximize profits.

In today's volatile economy and competitive business climate, the strategic use of IT is more critical than ever. Clearly, the winners are those information executives who make the wisest technology investments and successfully implement information technology in line with their companies' strategic goals.

CIO's next executive conference—"Perspectives: Maximizing Profits Through Information Technology"—is specifically geared to help senior executives secure business payoffs for their corporations. We invite you to join us March 10-13, 1991, on Amelia Island Plantation, Amelia Island, Fla., for this important three-day event. To ensure your participation, register today by calling Lori Cardarelli or Diane Martin at 800 343-4935 (in Massachusetts, call 508 935-4631).

Walter L. Woz

Coming In CIO

Cooperative Processing

If your mainframes or minis are linked to PCs, you're probably spending more time, money and processing power than you need to and getting less integration and ease of use than you should. Cooperative processing can change all that.

CIO, Present Imperfect

Has the CIO "arrived"? If so, the destination may be less than he or she had hoped. A new study suggests that while most senior executives have tremendous respect for CIOs' achievements, they also have some reservations about the IS executives' standing as corporate leaders.

Telemarketing

Connecting a company's phone system to its host computer can yield tremendous benefits for its telemarketing efforts—or provide a great jumping off point for launching such a campaign.

CIO, Future Perfect

Experts are predicting that the CIO of tomorrow will finally fulfill the expectations so many have held for so long.

PHOTO BY GEORGE SIMIAN

When it comes to overseas private lines, are you in over your head?



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TRENDLINES

PRESENTATION DEVICE

A POINTER WELL TAKEN

For the PC-proficient who lose their cool and their presentation abilities when they get too far from their computing tools, Computer Accessories Corp. of San Diego offers Proxima Cyclops, an interactive presentation pointer system that acts as a remote-control mouse.



REMOTE-CONTROL *input device*

Using a liquid crystal display (LCD) projection panel equipped with a camera (the whole unit rests on an overhead projector), a computer and the pointer, a presenter can pull down menus, activate buttons and draw and select objects from anywhere in the room by aiming the Cyclops pointer at the projection screen and clicking on the image.

The Cyclops pointer is 3 feet of plastic with a button on the handle. The beam of light that it projects onto the screen acts as a cursor. To pull down a menu or call up a file, the user simply touches the pointer to the screen and clicks the pointer button the way he or she would a mouse button. The camera, which is also aimed at the screen, sees the cursor and translates the click command to the computer. For presentations where

proximity to the projection screen is a problem, the company offers a laser pointer that will project a laser beam from up to 20 feet away; the camera reads the point of light.

Cyclops users can choose from two LCD projection panels that offer either 16 or 512 colors. The company, which will change its name to Proxima in April 1991, says that by freeing speakers from the operation of the computer, Cyclops allows them to roam the room and use body language

to communicate as effectively as possible.

Cyclops is yet another step toward an automated office so portable that all a user needs to do is disassemble it, pop it into a briefcase and later plug it in anywhere on the road. Computer Accessories has designed its products with this vision in mind—the LCD is book-size, the plastic pointer breaks into two pieces, and the laser pointer would be safe in your pocket protector. (The whole setup could easily fit into a standard-size briefcase.) Furthermore, the products work as well with a small portable computer as with a desktop PC. Now the only question is how to fit that overhead projector into your garment bag. ■

HELP FOR WORKING PARENTS

As more families find it necessary for both parents to work outside the home, companies are feeling increasing pressure to provide, or at least to help find, day care for employees' children. In light of this need, Executive Telecom System Inc. of Indianapolis has added a new Child Care Database (CCARE) service to its Human Resources Information Network, an online information-retrieval service that provides access to over 100 human-resource databases.

CCARE, which is provided to the network by Care Connectors Inc. (also of Indianapolis), offers instant access to data on thousands of child-care facilities across the country. Clients can search for day-care centers and in-home care by state, city, type of care needed, ages of children, etc. The database provides more than 50 particulars on each day-care provider (its years of experience and whether it offers developmental programs or accommodations for handicapped children, for example), thus saving valuable time by reducing the number of potential providers employees need actually visit.

As women represent an increasing percentage of the work force, according to Roger S. Billings, founder of Care Connectors, "a reliable child-care assistance program can attract and retain workers, lower absenteeism rates, improve employee attitudes, and bolster community relations." ■



OPEN SYSTEMS

DESIGNS FOR A BETTER FUTURE

Two major computer vendors recently announced open-architecture software strategies for their products. Both Unisys Corp. (of Blue Bell, Pa.) and NCR Corp. (of Dayton, Ohio) regard the move as a way to protect their installed bases while appealing to customers seeking non-proprietary solutions.

Under its Integrated Information Environment, Unisys is offering three classes of connectivity services to address formal standards, de facto standards and proprietary systems, as well as five sets of software services to handle such functions as application design and system security and management.

Under the new architecture, mainframes still represent the hub of the network. They connect to departmental servers that integrate IS and end-user applications and let scattered computers share information. Workstations give users access to the network and personal productivity tools.

Unisys initiated its software program with new operating-system software for its proprietary 1100/2200 and A series mainframes. The OS 1100 System Base 4 and Mark 3.9 operating systems are compliant with the Open Systems Interconnect (OSI) set of standards. Unisys also unveiled three OSI modules for message handling; file transfer, access and management; and inter-process communication. Both the operating systems and the OSI software

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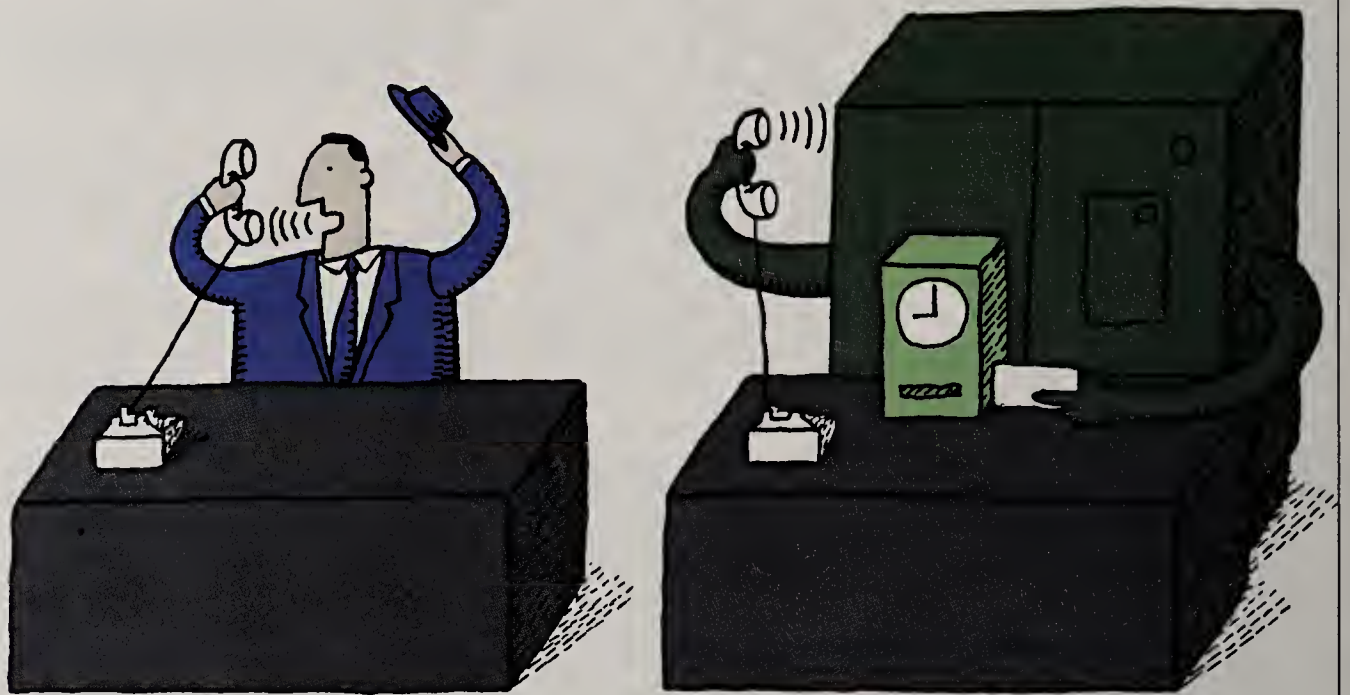
will ship in the first quarter of next year. Pricing will depend on configuration.

NCR's NCR Cooperation, a workstation-resident product suite of 54 software modules, is designed to connect "islands of automation," according to the company.

The key technologies behind NCR's architecture are object-orientation, the client/server computing model and open systems. Object-orientation, said Philip Neches, senior vice president and chief scientist, allows applications to be encapsulated, which in turn lets them interoperate with other applications. It also lets systems developers reuse up to 80 percent of existing code when developing a new application.

The Cooperation modules fall into four basic categories: information access services, user services, application services and network services. The first release will run on any 286-, 386- or 486-based personal computer with either the industry-standard or MicroChannel Architecture bus. While OS/2 is required for the server, the clients must run DOS, the company said.

General availability will be in March. The modules range in price from \$80 for an electronic workgroup calendar to \$39,740 for a 64-user version of Cooperation UNIX. ■



VOICE APPLICATIONS

RINGING IN THE WORKDAY

For employees at Sikorsky Aircraft, the tedious practice of filling out time cards has gone the way of the telex machine. Thanks to a new voice-mail system, reporting daily work hours is now as easy as picking up and dialing a telephone.

According to David Muir, time-keeping manager at the Stratford, Conn.-based helicopter manufacturer, the old method of manually reporting each employee's hours was becoming unwieldy. "Because we're a government contrac-

tor," Muir said, "we're required to report all our labor hours on a daily basis." In practical terms, that meant that approximately 3,000 Sikorsky employees had to fill out cards listing not only their hours, but the different jobs they worked on. Each card then had to be processed in the data-entry department. "Sometimes people forgot to fill out the cards or they didn't do it correctly," Muir said. "Trying to keep track of who did what got to be a real mess."

Now, at the end of each day, employees call the voice-mail system using a three- or four-digit password and answer a series of questions. The information is automatically entered into the company's central computer system, thus eliminating the need for cards and the possibility of data-entry errors.

The 84 voice lines that Sikorsky has installed are rarely busy because employees work on flextime schedules and are not all calling at the same time. If a hard copy is needed, a report can be printed out within minutes.

Muir considered other technologies, such as bar-coding and optical character recognition, but decided to go with a voice system from TALX Corp. of St. Louis because "everyone knows how to use a phone."

One potential drawback of the system is that anyone equipped with a touchtone phone and a password can gain access. This could present an irresistible temptation for some shirker to call in while sipping a margarita on the beach in Cancun. However, since Sikorsky uses its system for purposes of record-keeping only, such an abuse has not occurred.

"So far there have been no problems," Muir said. "And no one wants to go back to the old way." ■

SAIS IT AIN'T SO

Deadpan comic Steven Wright tells a joke about a charity to help the "bilingually illiterate—those unable to read and write in two languages." Well, one down, one to go. Our October feature on global networking ("Networking's World Beaters") included a story about how the well-versed multinational CIO should possess some special skills, including "a sensitivity to other cultures." The story carried the headline, "That Certain Je Ne C'est Quoi." It ought to have read, "That Certain Je Ne Sais Quoi."

We meant well. But as reader Paul Straley pointed out (in an especially prompt letter of reprimand), a

rough translation of the *faux* French component of that headline would be "I it is not that what." Of course, it is not that which we intended. Straley observed the "delicious irony" of including so gauche a gaffe in a story on "international sensitivity." He also couldn't help adding that *Webster's Ninth New Collegiate Dictionary* cites the phrase as having "been used IN ENGLISH since the 17th century." So, as it turns out, we may actually have achieved technical bilingual illiteracy.

Thank you, Paul Straley. For your Gallic vigilance we offer you a year's supply of café olé. ■

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TRENDLINES

END-USER COMPUTING

AN MIS VIEW OF THE FIELD

In a recent survey of information managers, a whopping 87 percent of the respondents said that end users—all those non-MIS employees churning data on PCs, LANs or dumb terminals—lack adequate training to fully utilize the technology. But IS managers also see plenty of benefits to end-user computing and predict its expansion in their organizations over the next few years.

End users are tackling a number of different applications on their own, according to the survey, which was conducted by Los Angeles-based Vista Consulting for Crwth

(rhymes with truth) Computer Courseware, a computer-based training company headquartered in Santa Monica, Calif. Nine out of 10 respondents said that their end users are generating ad hoc reports and inquiries, while 46 percent said they are engaged in more complex analytical work. Fifty-five percent said end users are developing applications that are becoming part of the regular processing routines of their respective departments. The most active end users are found in the accounting and finance department, the survey indicates.

On the downside, nearly 90

DISADVANTAGES OF END-USER APPLICATION DEVELOPMENT

1 9 9 0

Lack of data integrity, audit trails, testing, or documentation.	89*
Users not properly trained in application development systems and procedures.	88
Deterioration of controls	72
Reduction in security	65
Applications running on inappropriate platform.	60
Other	18

*Percent of respondents

SOURCE: CRWTH COMPUTER COURSEWARE

percent of the IS respondents said they worry about the integrity of data in non-MIS concocted applications; they

are also concerned about audit trails, testing and documentation. Seventy-two percent said they were concerned with deteriorating controls, and 65 percent mentioned security issues. They ticked off lack of training as the second biggest obstacle to effective end-user computing; budget constraints were number one.

Still, when respondents were asked to cite the benefits of end-user computing, 89 percent checked off "user productivity," and 66 percent answered, "computer literacy." Sixty percent said that a nifty advantage of end-user computing is a reduction of the backlog, a continuing IS headache.

Looking into the future, respondents saw a dramatic decline in the next five years in the number of end-user applications developed for mainframes, while predicting that PCs, LANs, WANs and client/server technologies will grow in importance. Ditto graphical user interfaces. Nearly 60 percent thought that mainframes will be demoted to servers or data repositories, and 41 percent predicted that MIS will increasingly take on the role of in-house systems integrator.

PRIVATE (SECTOR) EYES

They're watching you. In an attempt to keep employees' noses to the grindstone, many American bosses are poking their own noses into their underlings' affairs, according to The Conference Board, a business research organization based in New York.

A survey of senior human resource, legal and administrative executives at 393 companies in the U.S., Canada and Europe showed that American bosses are more intrusive than their foreign counterparts when it comes to searching lockers desks or offices, electronically monitoring office behavior and even restricting intra-company dating (although restrictions on off-duty behavior are rare in all three regions).

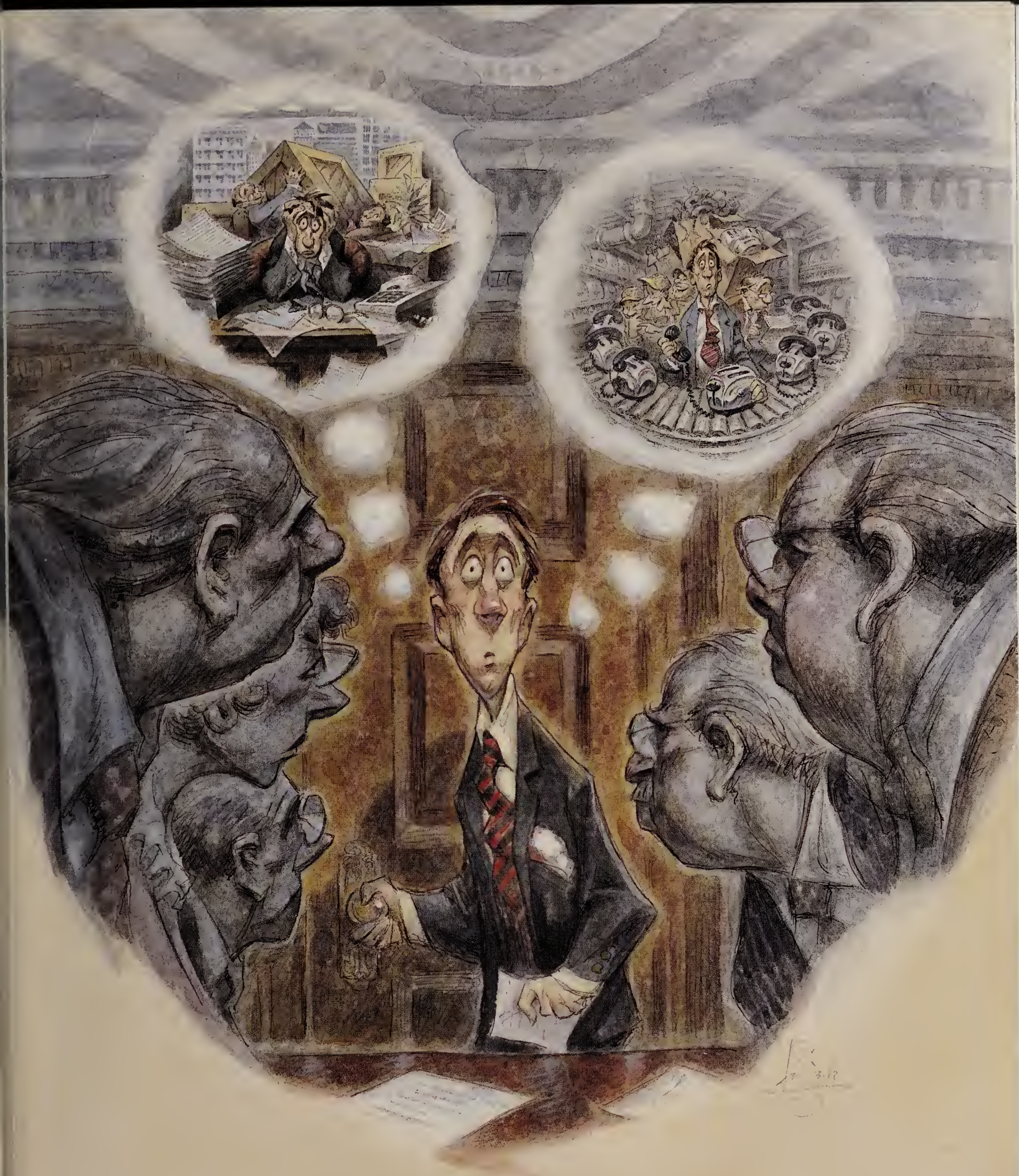
Two-thirds of the U.S. respondents said they will conduct searches if they suspect an employee of doing something that is harmful to the company; more than half of the non-U.S. companies do not engage in this practice under any circumstances. U.S. companies are also more likely to perform entry and exit searches of briefcases and handbags. And on-the-job



videotaping of employees and monitoring of electronic and telemarketing communications is somewhat more common among U.S. firms.

U.S. companies also perceived a greater need to collect information on employees' health, including psychiatric conditions and substance abuse. Nearly two-thirds of U.S. respondents said a lack of information in this area was a serious obstacle to controlling health-care costs.

Companies that avoid these practices called them inconsistent with their corporate philosophy, or cited fear of damaged morale or legal challenges.



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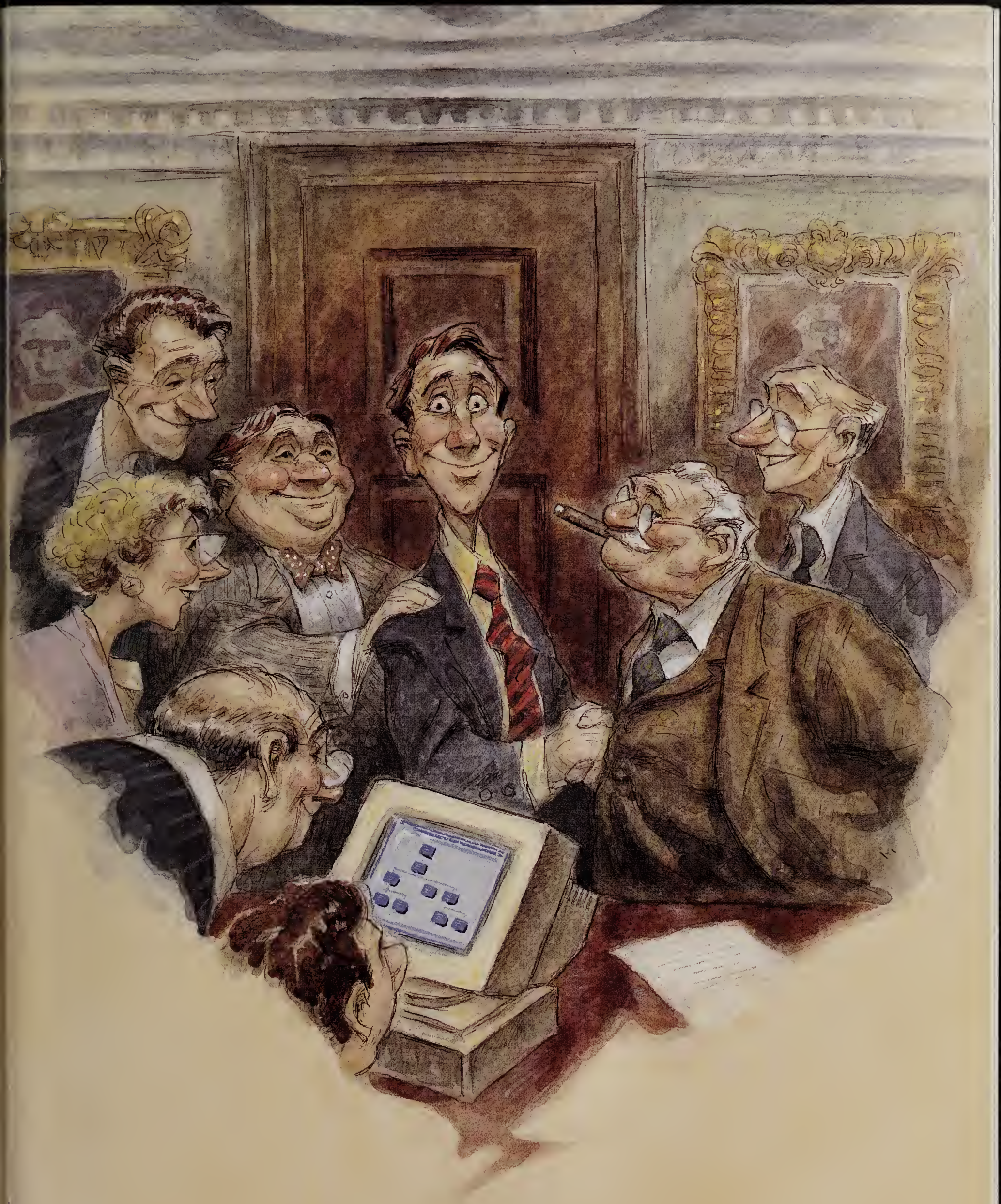
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*Systems Development Manager
British Bank*

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TRENDLINES

CONFERENCES

PARTLY CLOUDY, WITH A CHANCE OF IMPROVEMENT

At a CIO Magazine-sponsored conference on information strategies, held late in October in Palm Springs, Calif., the skies outside were sunny but the outlooks in the conference center tended to be somewhat clouded. Shadows of economic hard-times-to-come suffused many of the presentations—which often focused on using information technology to help produce cost-efficiencies and generally make more out of less.

In a rousing example of the ROI potential of IT, National Car Rental CEO Vincent Wasik outlined how several applications geared to offer customers fast, paperless access to rental cars helped turn what would otherwise have been a money-losing quarter into National's most profitable ever. So great is Wasik's belief in the pivotal role of IT, he said, that "any CEO who doesn't have the CIO as a direct-report is absolutely crazy."

Merrill Lynch CIO DuWayne Peterson speculated in a keynote speech that "there is a 30-40 percent cost-cutting opportunity in most [IS] organizations." He said that outsourcing deserves serious consideration as at least a partial mechanism for taking advantage of that opportunity: "Some people call it outsourcing, [but] I call it a strategic alliance," said Peterson of Merrill Lynch's big-ticket outsourcing relationship with MCI.

Peterson also cited consolidation of data centers and far-flung, often duplicative databases as another promising cost-cutting stratagem. For example, he said, Merrill Lynch has folded seven data centers into two and has plans



to unify 374 databases into eight databases.

If Peterson was predictably high on outsourcing, others remain aloof. Whirlpool CIO Richard Koeller, chairing a panel on the ROI of outsourcing and systems integration, observed that "there is as yet no time-based history" from which to reliably predict the outcome of an outsourcing decision. This may be why people are watching so closely the fates of Kodak's and Merrill Lynch's respective excursions into outsourcing. ROI panelist and Kodak CIO Katherine Hudson, noting that Kodak's business aims are to deal in "yellow boxes, not blue ones," said her capital budget has fallen from \$50-\$60 million a year to only \$3 million for 1991. But fellow panelist Chuck McCaig, senior vice president of Corporate Services at Mutual Benefit Life Insurance Co., likened outsourcing to marriage, saying that "When you go in, it looks very attractive. The problem isn't when it works, but when it doesn't work. Fixing it is a problem."

But perhaps the most combative panelist statement on outsourcing came from Martin Marietta Vice President for Computer-Aided Productivity Ray Wiltshire: "If you think

you can get rid of your problems by throwing them over the wall to some vendor, someone's gonna eat your lunch."

The menacing context in which all of this attention to ROI was focused was summed up in a presentation by Businessland Director of Business Development Glenn Miller. Miller said the problem of keeping up with technological development will be compounded by a lack of capital availability in an increasingly shaky economy. Corporations with good survival instincts will globalize and focus on big-E excellence.



VINCENT WASIK (top) addressing the CIO conference at the Hyatt Grand Champions Resort in Palm Springs.

Some examples of the E-word were presented by a panel on "breakaway applications" in which Kentucky Fried Chicken Vice President of Information Resources Monte Jones explained how KFC's computer-integrated restaurants have helped to increase sales and quality while lowering costs, moving the company closer to its goal of an 18 percent ROI.

Despite the sessions' emphasis on a cloudy economy, CIO's conference organizers remain committed to pleasant climates—the next conference will be held March 10-13 at Amelia Island, Fla. ■

RETAIL INNOVATION

Sears, Roebuck and Co.'s merchandise group is the first recipient of the newly established Retail Innovation Technology Award (RITA).

Sears was cited for its merchandise assortment planning system—or MAPS, for short. MAPS is a tool that helps department managers customize the overall product mix for each store's unique marketing needs; it then aids them in designing displays that give the greatest prominence to the most profitable items in the chosen assortment.

Second place went to K mart Corp., whose databases allow it to develop promotional efforts customized for individual stores. Third place went to Fortunoff, a Mid-Atlantic seller of jewelry, luggage and gift items with an IT-intensive customer-service operation. RITA is the brainchild of Chain Store Age Executive magazine and Digital Equipment Corp. ■

Toward Asset-Based IT

A recent survey shows that while companies may say they value IT as a strategic asset, their budgeting and investment-justification practices still treat it as an expense

BY ANTHONY P. DIROMUALDO

If you believe that your company could be doing more to use information technology on a strategic level but are frustrated by its accounting and financial control practices, take heart—you are not alone.

Many organizations do not yet fully take into account IT's strategic dimensions in their resource-allocation and investment-justification practices. In most cases, IT continues to be treated as an expense and resource to support the operations of the firm.

This is one of the major findings of a survey conducted by The Diebold Research Program concerning how companies justify investments in information technology. The study focused on whether companies view information technology as strategic and, if so, to what extent this is reflected in their investment-justification processes.

Analysis of the survey, which covered over 100 upper-medium-size to large companies in both the service and industrial sectors, yielded the following significant findings:

- IT is viewed multi-dimensionally, primarily as a resource supporting operational and administrative requirements, but also as having strategic importance.

- Budget-setting and project-evaluation practices suggest that companies, for the most part, treat IT as an expense rather than as an investment.

- Cost reduction and improved operational efficiencies are the criteria most often used to justify proposed IT projects and cited in the justifications of those approved.

- IT project-justification approaches have not kept pace with the growing strategic nature of IT.

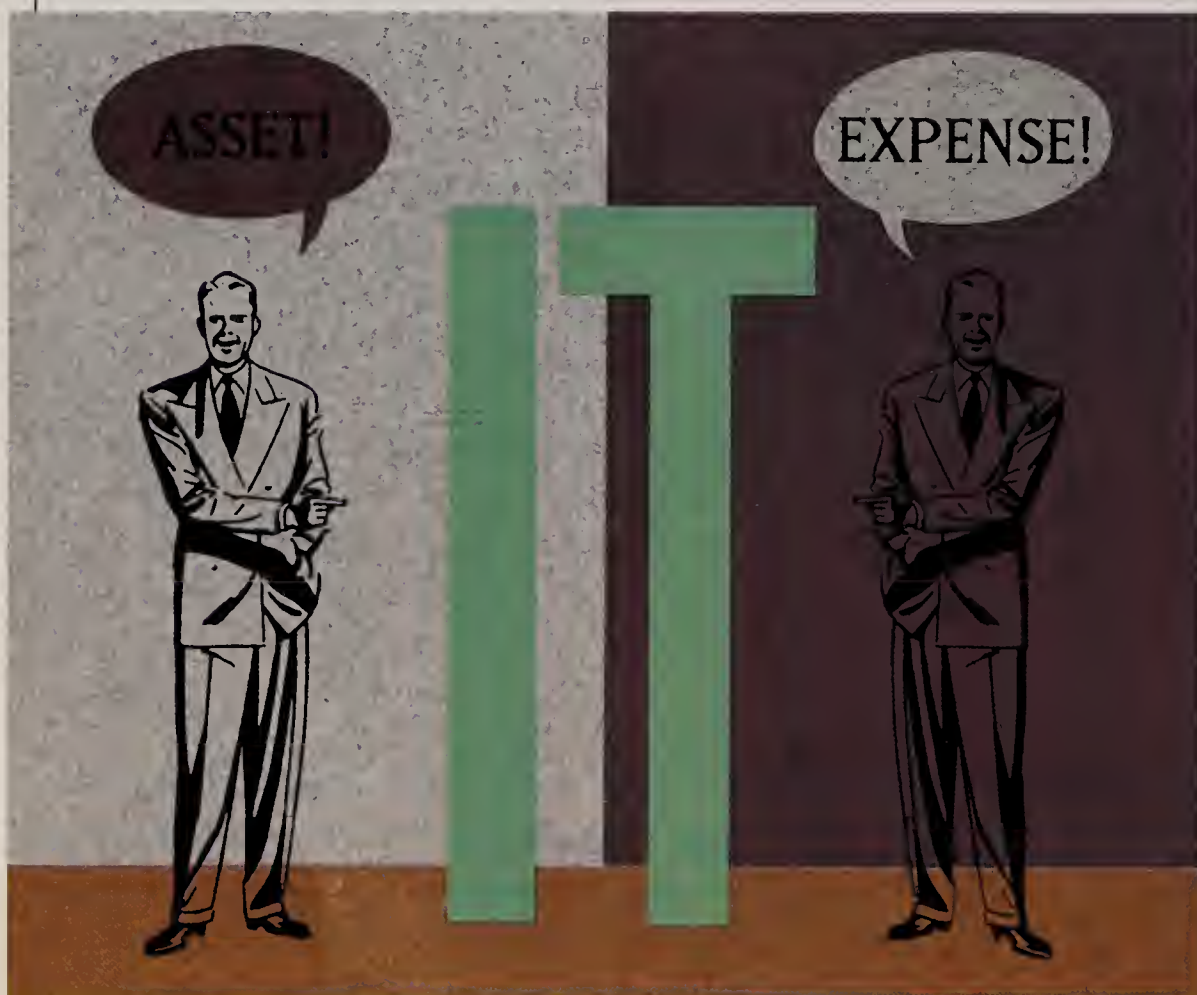
- IS managers believe that senior executives emphasize cost control in measuring their performance, while users stress quality of service provided.

- Most companies pay considerable attention to intangible costs and benefits when evaluating IT projects, but a significant number fail to quantify them in any significant way.

- Line management and management steering committees play a predominant and increasing role in evaluating and approving IT projects.

In analyzing the data, a distinct pattern emerged. Many companies acknowledge the strategic dimension of IT, yet their budget determination and justification practices are strongly oriented to its expense, administrative and operational aspects. There is not much evidence to demonstrate that IT is actually treated as an asset worthy of investment.

Survey respondents, all senior IS executives, were given the following choices to describe the



view or views of IT's role in their companies:

Administrative: IT is viewed as part of the cost of doing business, along with such overhead as office space, heat and electricity.

Operational: IT supports the day-to-day activities of the firm.

Strategic: IT is a factor directly influencing the company's competitive position in the marketplace.

Understanding how IT is viewed throughout the enterprise can provide insights into why certain justification techniques are used, who makes decisions and what criteria are applied.

Although there is a measurable appreciation in many of the surveyed organizations that IT can be a strategic factor, respondents believe that it is still predominantly seen as supporting operational and administrative needs. It is therefore not surprising that there is a heavy emphasis on financial evaluation techniques as well as cost- and efficiency-oriented justification criteria. Further, IS executives indicated that they believe their performance is measured by cost-control by senior management and by quality of service by users. In neither case is contribution to strategic objectives used as a tangible measure of performance.

Most of the surveyed companies set IT spending levels through an annual budgeting process. This process is not necessarily inappropriate, but it does leave open the question of whether the time horizons applied to budgets are adequate to address the long-term funding needs of strategic initiatives involving IT. Additionally, a variety of financially based techniques are being used to evaluate IT projects, despite the fact that such techniques are short-term in nature, single-project in scope and cannot take into account the many intangible factors involved in complex strategic decisions.

This leads to an often-voiced criticism of IT assessments: that intangible costs and benefits are many times not included in evaluation processes and, when included, are seldom quantified. This proved to be true of a vast majority of survey respondents, who said that while they do

try to factor in intangible costs and benefits when evaluating projects, a relatively smaller number quantify them. They also do not attempt to weigh hard and soft measures of return on a common basis.

Financially based techniques like discounted cash flow provide quantifiable evidence of return on investment but fail to provide measures of intangible benefits. When tangible measures of return are deemed unacceptable or inadequate, subjective justifications—such as senior-manager intuition or the credibility and influence of the project's sponsors—often become deciding factors. How-

Some agreed-upon methods for quantifying intangible values should be established if investments are to be rigorously and realistically assessed.

ever, the more intuitive or subjective the assessment criteria, the harder it may be to know whether the desired results are being achieved and, if so, to what degree IT has a part in bringing them about. Quantifying intangibles, even using semi-hard measures like weighted scores, can provide a common basis on which to compare tangible and intangible costs and benefits. While determining appropriate justification criteria for investment decision-making is no simple task, it is a task that cannot be avoided.

The justification criteria cited by many of the responding companies support the notion that cost-oriented motivations are the driving forces behind automation. They overshadow more strategic criteria such as increased market share, improved product quality and response to the actions of competitors.

This finding, however, may not en-

tirely reflect a lack of emphasis on employing IT for strategic reasons, but rather may indicate that hard justifications, or numbers, must be included to make an effective business case in order to get projects approved. Criteria such as cost displacement and labor savings are much easier to quantify than intangible benefits like greater flexibility and improved quality.

Knowing who has responsibility for evaluating, selecting, prioritizing and allocating resources to projects provides insights into who is directing and controlling the use of IT and why particular evaluation criteria are used. Survey respondents show there is a heavy involvement of steering committees in overseeing and directing IT expenditures. There is also evidence of increasing decentralization of IT decision-making to business and functional management, with decentralized IS management playing a role as well.

Steering committees are the most pervasive approach used to evaluate IT projects. Ideally, this approach affords all major constituencies input into the decision-making process, provides a forum for organizationwide issues, and allows consensus among stakeholders. However, steering committees can exert a counterproductive influence if they are over-politicized and used as a means to avoid taking risks, or if they are made up exclusively of upper-middle management, whose concerns tend to be overly parochial.

Despite all the talk about IT being strategic, this survey demonstrates that it is treated predominantly as a cost, supporting the lament expressed by many IS executives that senior management does not fully appreciate the potential strategic benefits of IT. Clearly, companies must give serious thought to whether they will be able to make necessary strategic investments in IT without first fundamentally rethinking their budgeting, control and investment decision-making processes. □□

Anthony P. DiRomualdo is associate director of The Diebold Research Program in New York.

Organizational Revisionism

A recent survey of IS priorities reveals that re-engineering the company's business procedures is the preeminent concern of CIOs

BY JAMES CHAMPY

More than most professions, IS management is a field of changing agendas. "Strategic systems" were the rage of the early 1980s, while the "information-based organization" was the watchword of the latter part of the decade. Now comes "business re-engineering." Judging by the results of the latest Index Group survey on the state of the IS profession, this concept will have a broad impact on all organizations.

For the second straight year, according to the survey, business re-engineering—reshaping business processes in ways that capitalize on the transformational capabilities of information technology—was the preeminent issue on the future agendas of 394 high-ranking IS executives at large North American corporations.

Other highly rated issues also reflect the recent re-engineering bent of information systems executives.

Instituting systems that enable information to hurdle the barriers separating business functions was the number-three issue (aligning IS and corporate goals was number two). Getting a new product rapidly out to market requires coordinating the thoughts and actions of various people across time and distance. Such "cross-functional" information systems are often a major technical underpinning of a re-engineering effort.

Boosting systems development productivity and improving the quality of the systems that the IS organization builds gained major ground in this year's survey. This new concentration on systems development is no accident, as attempts to overhaul archaic corporate procedures almost

immediately flag defects in a company's re-engineering machine.

As anxious as CIOs are to re-engineer the business, there is a lot of work to be done first. Only 37 percent of the IS executives said that their companies' executive managements were enlightened about re-engineering. Less than half said that the majority of their new systems in fact re-engineer business processes.

Similarly, the fact that aligning IS and corporate goals is still a high priority, combined with the fact that less than one-third of the IS executives are involved in strategic planning activities, suggests that too many business executives still do not place IT on the strategic agenda. This attitude may be deserved since senior managers are accustomed to seeing low value from systems that automate current processes.

Unfortunately, getting money for new systems, whether they re-engineer the business or not, will be no easy task. Budget growth is off for '91, and 61 percent of the respondents are being pressured to quantify the value of IT spending. The budget squeeze will require radical approaches to reallocating scarce application-development resources. In fact, it should only strengthen the resolve of CIOs to re-engineer the key business processes of their organizations.

If a proposed information system does not re-engineer a key business process, it should not be funded. The easiest way to shatter the validity of business re-engineering and make it just one more management fad is to champion technology initiatives automating "business as usual" under the guise of radical process change. ☐☐

James Champy is chairman and CEO of the Index Group, in Cambridge, Mass.

Top Ten 1991 Management Issues

1991	1990	1989	1988
1. Reshaping businesses processes through IT	1	11	NR
2. Aligning IS and corporate goals	4	2	1
3. Instituting cross-functional systems	3	7	NR
4. Boosting software-development productivity	6	13	12
5. Utilizing data	7	6	7
6. Developing an IS strategic plan	5	4	2
7. Improving software-development quality	14	NR	NR
8. Creating an information architecture	9	5	5
9. Integrating information systems	16	12	6
10. Improving leadership skills in IS	NR	NR	NR

SOURCE: INDEX GROUP INC

NR = Not Ranked

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JOHN GIBBONS: *Information technology is "a horse we have to ride."*



C

IOs and other managers often complain that technology moves far too fast to let them follow all the developments and ramifications of even one small piece of it. They should just be glad they don't have to stay on top of all of it, as do the brave souls at the Office of Technology Assessment.

Created in 1972, the OTA is the federal agency charged with supplying Congress with the information and perspective it needs to make legislative decisions about complex technologies. It's not just a glorified research tool. The OTA goes well beyond the already impressive task of sorting through the vast waves of technology-related information washing over our society; it fashions deeply analytical reports that lay out various policy options and their likely consequences. In most cases, one of these policy options will eventually end up being implemented in some form as the law of our land. "Con has come to"

The Office of Technology Assessment does for the U.S. Congress what some say a good CIO does for executive management: resents complex technology options plain language and within relevant contexts

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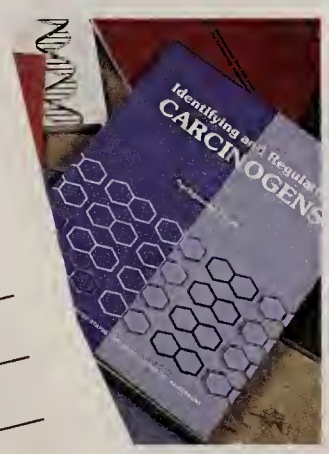
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MANAGERS

by DAVID FREEDMAN

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device sitting there Buddha-like in the dark.
soft as a prayer, "Don't get old on me. Don't
jacket. Grow. Expand. 30,000 lines." And
the air conditioner, I heard this voice say,
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of my hardware can stay the same.
ISDN...virtually limitless growth. It can all
the Rambler home, the 8-track boomed and
all, is just choices.



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The OTA's efforts cover a wide range of subjects, indeed. In the past two years alone, for example, it has produced reports (which often exceed 200 pages) on high-temperature superconductivity, adolescent mental health, rocket boosters, radioactive waste, gene mapping, aviation safety and locusts. Needless to say, information technology gets attention

"Congress has come to know that we're accurate. They've even gotten used to the fact that we often have bad news for them."

—John Gibbons



from the OTA as well. "Information technology is one of those ubiquitous phenomena that relate to so many areas that affect our lives," said Gibbons. "The rate of change within the field is so extraordinary and unending, it's a horse we have to ride."

As a result, the agency has dedicated a group to producing IT-related reports. That group is headed by Jim Curlin, who picked up a doctorate in soil science and a law degree before making his way into government. Curlin wasn't exactly a stranger to IT when he took over leadership of the group two years ago: In addition to being a regular user of computers and having helped plan a national

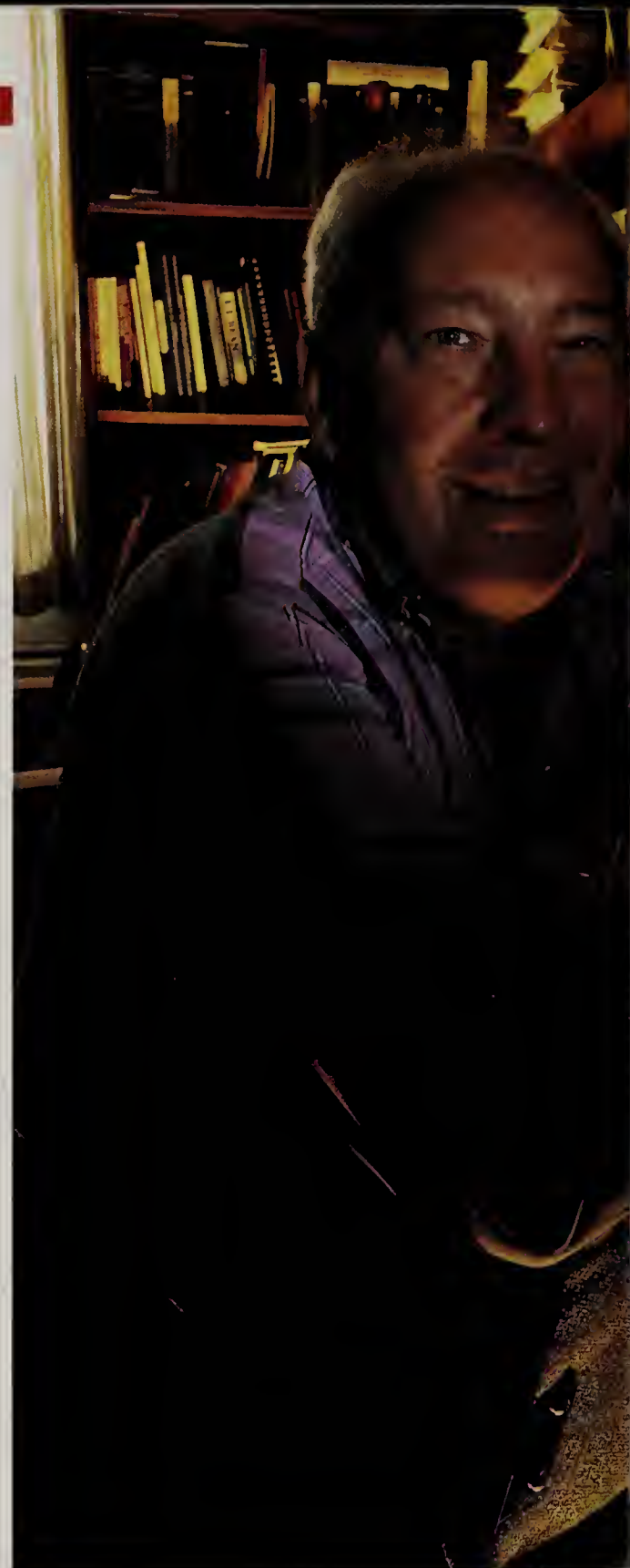
computer network, Curlin has been a dedicated ham radio enthusiast for nearly 30 years. "When you take a look at some of the newest data communications technologies to come along, it turns out they were pioneered by the amateur-radio-operator community," he said. "Ham equipment is so sophisticated now that it can destroy the reception of every TV in a city block."

Ham radio may be an inspiration to Curlin, but you'd never know it from the scope of the projects that come out of his department. Among the recent IT-related OTA reports: "Critical Connections: Global Securities Markets and Information Technology," "Electronic Bulls and Bears: Securities Markets and Information Technology," and "Defending Secrets, Sharing Data: New Locks and Keys for Electronic Information."

Although no one would mistake any of these titles for the latest Tom Clancy thriller, they are snappier than what one might expect from a Congressional agency. That's in keeping with the agency's policy of writing reports that are accessible to almost anyone—especially the non-technically oriented Congresspeople who usually commission the reports—and that are mercifully stripped of any traces of techno-speak or bureaucratic effluvia. The "Critical Connections" report, for example, manages to quote both Marshall McLuhan and Machiavelli.

One might be tempted to question the objectivity and practicality of such reports, given the fact that they are produced in the circus of federal politics rather than in the colder, clearer air of the free market. In fact, it's generally acknowledged that the OTA was little more than a political football for the first seven years of its existence, until Gibbons took on his first six-year term at the helm. "I'm the first of the agency's three directors to finish a term and sign up for a second," he said.

It's still a juggling act, he pointed out. But Gibbons has overseen the construction of a labyrinthine process of delicate—and not-so-delicate—checks and balances that seems to do



JIM CURLIN: Some executives would probably benefit from taking a closer look at the OTA's handiwork.

the trick. Reports occasionally charge into the thick of controversy, as when a report on the Reagan administration's "Star Wars" Strategic Defense Initiative stated that SDI's software reliability would always be an open question, and when the report on the nation's communications infrastructure warned that the Regional Bell Operating Companies are, as Curlin put it, "simply out for whatever is best for them." Still, the OTA is rarely accused of a lack of balance, a remarkable accomplishment in Washington's tug-of-war atmosphere. "We often end up getting quoted by both sides in a Congressional debate," said Gibbons.



al, the OTA starts bringing in outside experts to help prepare the report. That's partly because the OTA's full-time staff of 150 couldn't possibly do all the work itself; the OTA is the smallest Congressional agency, with a \$16 million annual budget that is 3 percent of the General Accounting Office's. But the dependence on outside expertise also reflects the agency's determination to pull together the highest-quality—and most diverse—thinking that goes on in the area under study. "We're not looking for neutrality," said Gibbons. A recent study on adolescent health included the participation of Girl Scout leaders, psychiatrists and an entire panel of adolescents.

Despite its modest resources, the OTA manages to turn out a respectable 20-or-so full-scale reports per year, as well as a number of less extensive "background papers" and "Congressional memos." Of the major reports, about four come from Curlin's group, which has a staff of 20 and an annual budget of \$1.3 million. Perhaps even more than other OTA groups, Curlin's relies heavily on industry executives for input.

"We sometimes bring competitors face-to-face across the table and let them fight it out," he said. "Everyone has a different idea about what constitutes the state of the art. If everyone on one of our panels agreed with one another, we'd be worried."

Do the IT reports ever have much direct impact on business? Probably not, said Curlin. For one thing, they're not widely circulated, despite the fact that they're available to the public for a mere \$10 to \$20. The Government Printing Office usually prints only about 2,000 to 3,000 copies, and the great majority of these stay within government circles.

"A lot of our reports hit the ground with a dull thud," sighed Curlin. But some executives would probably benefit from taking a closer look at the OTA's handiwork, he contends. "A thoughtful executive at a Regional Bell Operating Company would probably want to take our report on communications into account in strategic planning."

Business is, of course, affected by the Congressional policy decisions in which OTA reports often play a substantial role. Well, at least Gibbons hopes they play a role. "Sometimes it seems they don't pay any attention to us," he said. He added that he can hardly blame Congress. "It's a little unnerving for us to have to deal with the different technological issues, but

The OTA is rarely accused of a lack of balance, a remarkable accomplishment in Washington's tug-of-war atmosphere.



Congress has to deal with all of this plus every other issue that comes before government."

Gibbons sometimes wonders if the OTA is going about the whole thing backwards. "Jefferson said that only an informed citizenry can be trusted with self-government," he noted. "Maybe the OTA should inform the public, so that the public can inform Congress." You can decide for yourself by calling the Government Printing Office Bookstore at 202 783-3238 and asking for a catalog of OTA publications. 

David Freedman is a freelance writer based in Brookline, Mass.

The process of producing a report generally begins with a request from a Congressional committee. The OTA staff then polls other committees to see if the subject has some "cross-jurisdictional" interest. After performing some preliminary research, the staff fashions a formal proposal and submits it to the Technology Assessment Board, which consists of six members each from the Senate and House, split evenly between Republicans and Democrats. "We've got the extremes of both parties," said Gibbons, noting that the board includes such balancing forces as liberal Massachusetts Sen. Edward Kennedy and conservative Utah Sen. Orrin Hatch. "That balance ensures that we won't be captured ideologically, and that we have political protection."

Once the board approves a propos-

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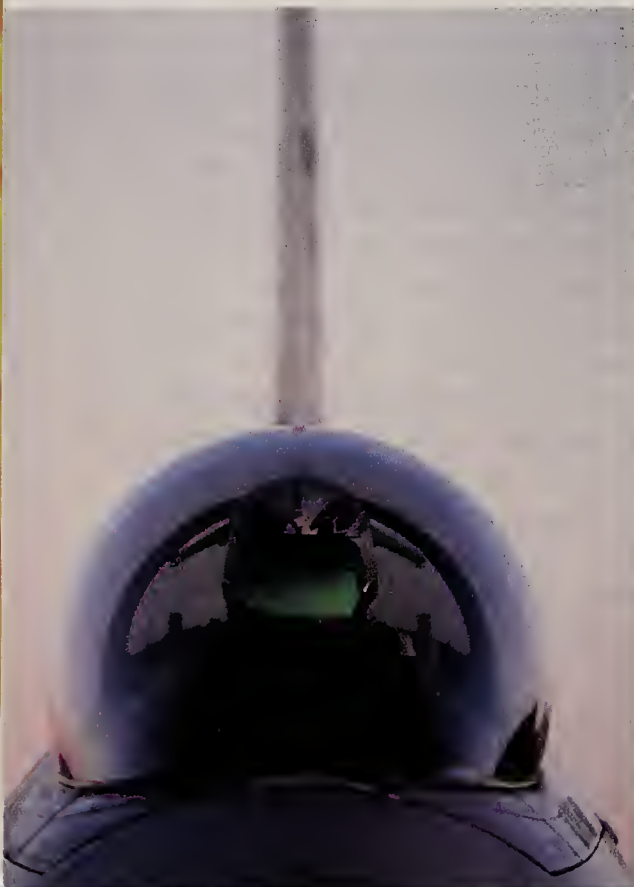
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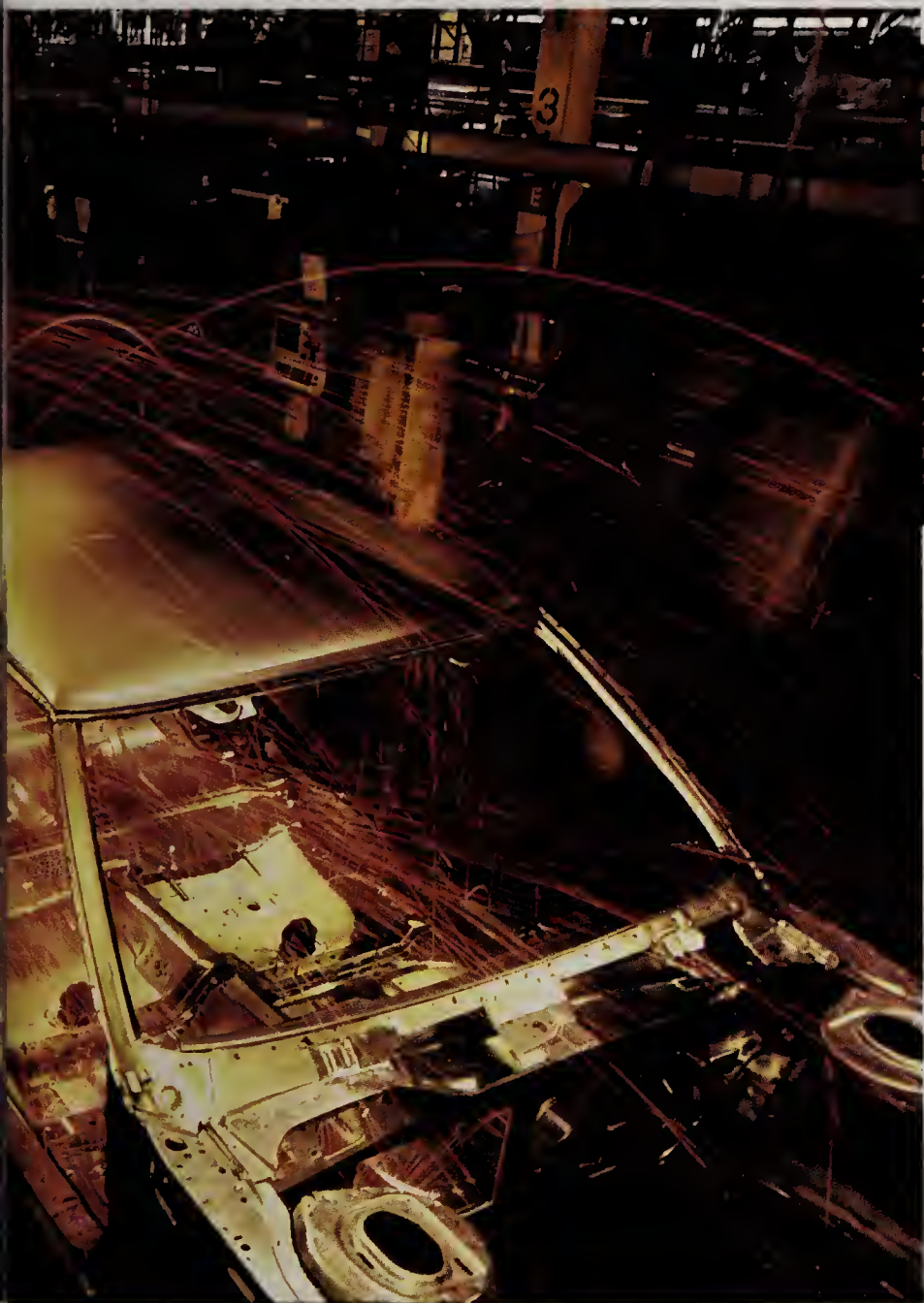
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THE CORPORATE MAKE-OVER

Companies faced with
the need to overhaul
outdated business
processes
are turning to business
re-engineering,
a methodical technique
for identifying and
enhancing the essential
while paring away
the obsolete

BY ALLAN E. ALTER

IN THE U.S. WORLD, BUZZWORDS come in and go out of fashion as frequently as wide lapels and narrow ties. But "re-engineering" may turn out to be a classic like the blue blazer. Business re-engineering is emerging as some of the most important work undertaken by CIOs and IS professionals, and leading such efforts is becoming one of their most crucial roles.

The term "re-engineering" has come to have several different meanings and is often used to describe the techniques of using old software code in new systems. But business re-engineering (also known as "work re-engineering" or "business process redesign") means something entirely different. As consultants and practitioners describe it, business re-engineering is a methodical process that uses information technology to radically overhaul and dramatically improve business processes, and thereby attain major business goals.

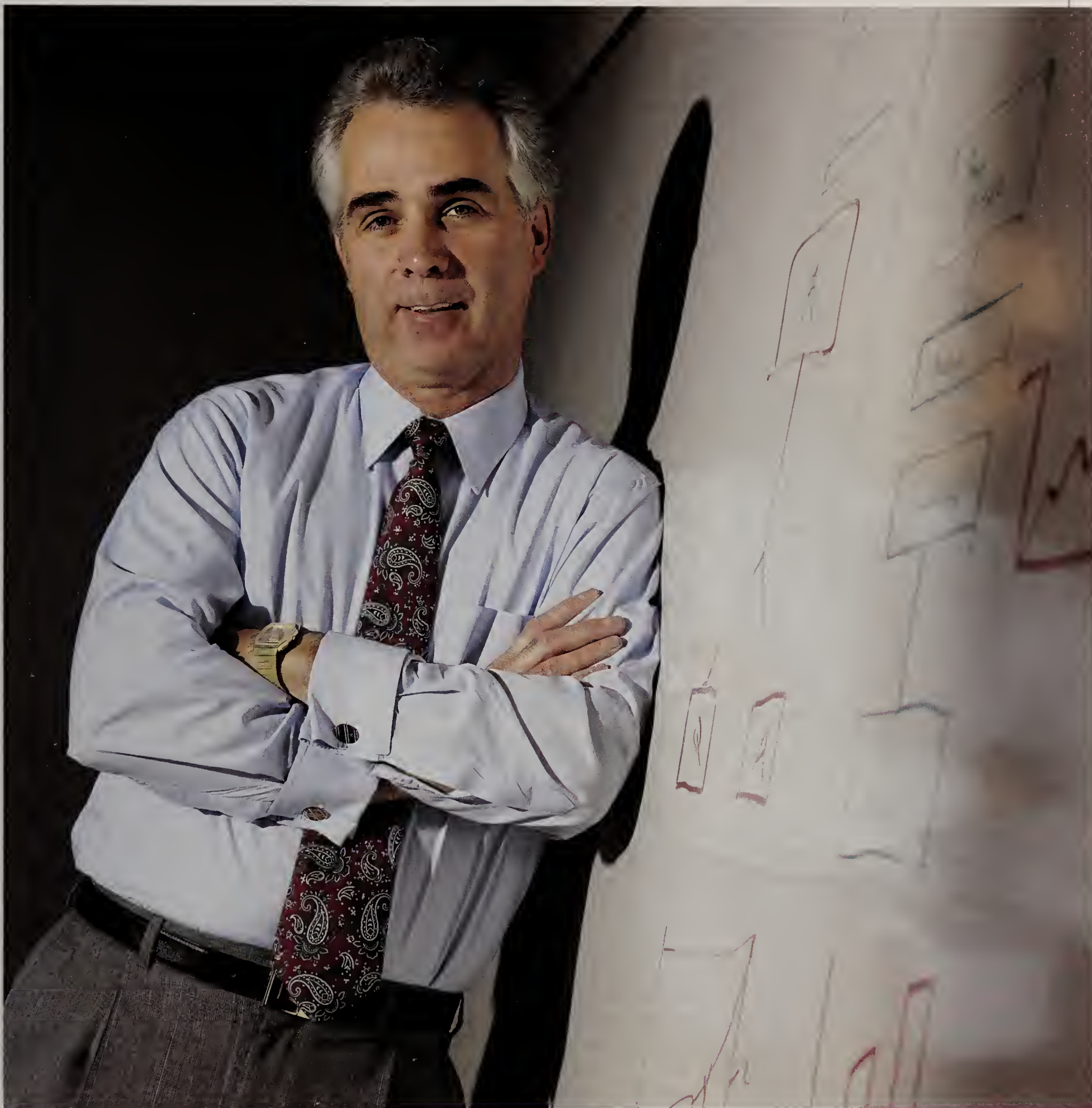
"Re-engineering is difficult and

painful," said Donald Falkenstine, an assistant vice president involved in re-engineering efforts at Cigna Corp., a Philadelphia-based financial-services company. Its radical nature makes re-engineering risky and time-consuming work, and it requires careful planning, plenty of top-level executive support and significant changes in organizational behavior to be successful.

Nevertheless, Cigna and other enterprises are undertaking re-engineering efforts at various levels—within individual departments or functions, across several functions, even throughout profit centers and entire corporations. Two companies—typically suppliers and customers, such as a parts supplier and an automobile manufacturer—can use re-engineering techniques to function as if they were one firm. Ford, Bristol-Myers-Squibb, Hallmark Cards, Tupperware, Digital Equipment, Dow Chemical, Steelcase and Continental Bank are some of the other companies that have completed, or



SUSAN KOZIK and DAVID FALKENSTINE: stepping up to re-engineering at Cigna Corp.



BRUCE J. RYAN: *Employees rarely consider how re-engineering will affect their own positions.*

are currently in the midst of, re-engineering efforts.

In the 1980s, CEOs and CIOs learned two difficult lessons. The first was that even successful companies must abandon old ways of doing business and embrace new ones in order to improve sufficiently to survive.

The second was that IT brings the greatest benefits when firms use it to create new and more effective business procedures rather than to automate old ones. The concept of re-engineering combines both insights, and then provides a rigorous, methodical way to achieve sought-after goals

such as lowering costs, eliminating unnecessary work (and jobs), improving service and increasing speed to market.

UNLIKE THE CONCEPT OF "strategic information systems," re-engineering "starts in

a more focused way in identifying critical business processes," said Michael Hammer, the president of Hammer and Co., a Cambridge, Mass., information-technology consulting firm and a leading popularizer of business re-engineering. (Hammer published an article on the subject in the July-August 1990 issue of the *Harvard Business Review*.) "Rather than just casting about, hoping that lightning strikes, it has some structure and methodology to it."

If IT is an inherent part of any re-engineering effort, IS organizations and CIOs have a leading role to play. But what exactly should that role be?

The answer varies from company to company. But as important a role as some CIOs do have, they can not inaugurate, lead or carry out a re-engineering effort on their own. The stakes and risks are too high, and the need for leadership, insight and hard work from other business functions is too great. After all, "this is not something where you put in a new network and a jazzy new system and suddenly you are doing wonderful things," said John Collins, Hallmark vice president of management information systems at Hallmark Cards Inc. of Kansas City, Mo.

"Re-engineering cannot be IS's crusade," said Hammer. "IS does not have the authority, or the credibility, to launch such a crusade. Re-engineering has to be driven by the senior management of the organization."

It also needs to be driven, to a great extent, by the line managers of the business functions undergoing the re-engineering effort. It is important to get managers from all parts of the company into the process so that "this business design activity [can be] looked at from all angles," said Albert J. Travis, a senior manager at Nolan Norton & Co.'s Chicago office. "The best people to decide how work can be done better are the people who do it. We've seen that in manufacturing, in quality-circle concepts."

While IS may facilitate the re-engineering process within business units, business managers should decide what will happen to their busi-

ness processes, said Ruth Bruch Modersohn, managing director of information technology and resource management at Continental Bank of Chicago and a leader of the bank's re-engineering efforts.

But there are two roles CIOs and the IS department seem especially well-suited to play. One is that of catalyst or initiator of the re-engi-

IS managers "are accustomed to holistic process thinking, which re-engineering demands but which is in scarce supply in the company. And they are accustomed to change, which is intrinsic to business re-engineering, since they endure it from vendors and inflict it on users."

—Michael Hammer

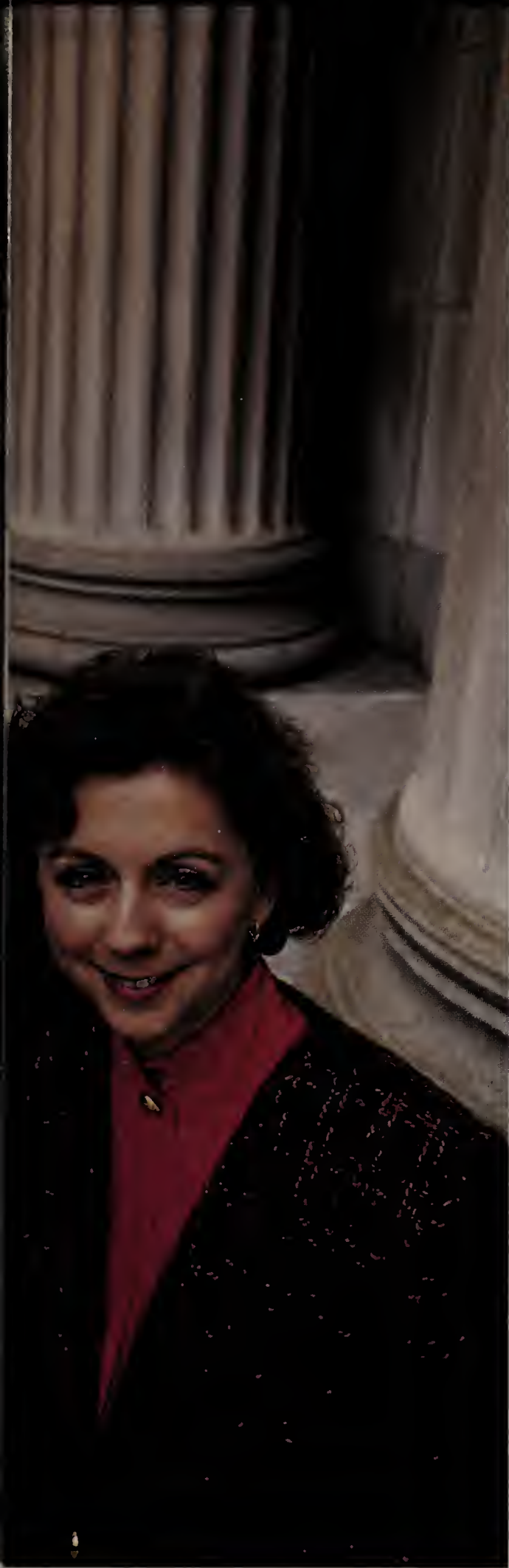
neering effort. Someone, somehow, has to provide the spark that ignites this process. Often, this falls to CIOs, who can generate interest in a number of ways, according to Hammer. They may circulate an article, he said, or "bring a senior executive to a seminar on the topic. They may politic for it, write a white paper on the topic or determine what competitors are up to to try to stimulate thinking on the topic."

Re-engineering efforts at Cigna, Hallmark and office-furniture manufacturer Steelcase Inc. were all sparked by IS.

Ray Caron, president of Cigna's



systems division, can be described as the father of that firm's re-engineering program. According to Susan Kozik, assistant vice president of re-engineering, Caron and other top Cigna executives recognized that IS and business strategies needed to be linked more closely. But Caron (in part by bringing Hammer to a meeting of Cigna's management council) convinced the CEO and other top executives that the answer lay not just



JOHN L. GIGERICH and RUTH BRUCH MO-
DERSON: *IS leads the process at Continental.*

in creating new systems, but in new thinking about how Cigna's staff perform their jobs, Falkenstine indicated.

Hallmark's top executives, according to Collins, generally realized that the company's continuous improvement efforts, while useful, could not deliver the breakthroughs needed to

ensure long-term success. Collins introduced the concept of business re-engineering to other executives; the idea made sense, and Hallmark decided to begin the process.

At Steelcase, based in Grand Rapids, Mich., senior IS management successfully lobbied the top brass to replace an advisory CIM steering committee with an organized re-engineering effort, according to Robert Scott, director of IS.

There's another and more important role that IS can play. According to Hammer, IS can be the company's "center of expertise in re-engineering: . . . the repository for technique and expertise to work with functional managers as they go about the re-engineering process." In practice, this usually means that IS executives are recognized as equal members of the multi-functional teams that carry out the re-engineering, and as the leaders of the IT part of projects. In some companies, IS executives and their lieutenants are put in charge of running the re-engineering effort as a whole.

WHILE I.S. EXECUTIVES MAY not have the authority to launch a re-engineering campaign on their own, there are several reasons why IS management is well-suited to re-engineering leadership once the campaign is approved by top management. IS managers have a corporatewide perspective, experience in working with business leaders in many parts of the organization and a knack for systematic thinking, said Falkenstine. According to Nolan Norton's Travis, this leaves IT planners in most companies "in a better position to facilitate the cross-functional discussions that need to take place."

Hammer observed that IS managers "are accustomed to holistic process thinking, which re-engineering demands but which is in scarce supply in the company. And they are accustomed to change, which is intrinsic to business re-engineering, since they endure it from vendors and inflict it on users."

In addition, said Hammer, although re-engineering must be driven by se-

The Nature of the Beast

While there may as yet be no bona fide re-engineering methodologies, there are ways to recognize a re-engineering effort when you see one

According to Michael Hammer, the Cambridge, Mass.-based consultant who claims to have coined the term "business re-engineering," there are four hallmarks of a true re-engineering project:

Ambition: Looking for quantum leaps rather than marginal improvement. For example, planning to reduce the time to market by 50 percent.

Breadth of scope: Looking beyond the existing organizational boundaries and looking for the real processes.

Breaking the rules: In every re-engineering endeavor, firmly held rules about how the business is supposed to operate are exposed as no longer useful, and then rejected.

Using IT to invent new processes: For years, said Hammer, businesses have been using systems to "create automated versions of the manual processes we've inherited from the past. Re-engineering is about creating automated processes that have no manual equivalents." For example, when Ford Motor Co. re-engineered its accounts-payable department, it began to conduct business in a way that could not be done without an online database and communications network.

—A.E. Alter

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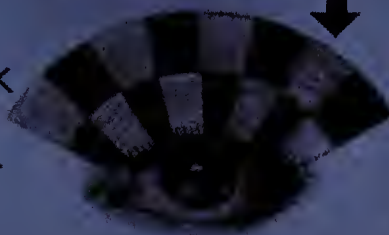
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The Dark Side of Change

.....

Radical change is always threatening,
and re-engineering projects almost always
involve radical change

While employees may seem amenable to a re-engineering effort at first, according to Bruce J. Ryan, vice president and corporate controller of Digital Equipment Corp. in Maynard, Mass., and a re-engineering veteran, people rarely consider the implications of re-engineering for their own positions until implementation begins.

"Periodically we step on a land mine," said Susan Kozik, assistant vice president of re-engineering at Cigna Corp., a Philadelphia financial services company. "A line manager may say, 'Re-engineering is a great idea, but my area is under control. You can study our next-door neighbor; my turf is my turf.'" Line managers may, in fact, believe they are already carrying out an idea, Kozik explained, or their commitment to re-engineering isn't sustained when push comes to shove.

What are people afraid of? Mainly losing their jobs. This is not surprising, since re-engineering efforts often result in job elimination. According to Cambridge, Mass.-based consultant Michael Hammer, people also fear that the expertise which has been their stock in trade may no longer be valued, or that they will not be successful under the new regime. Furthermore, many people just don't like learning to do things differently.

"The re-engineering team needs sensitivity to personal needs, feelings and changing management roles," said Hammer. At Cigna, said Kozik, "We do some careful thinking on how to get that person on our side. We need to make them feel they look good."

Presenting employees with a prototype of how the re-engineered organization will work can help, according to Ryan, by clearly demonstrating that the benefits of the new way of doing business are real.

It's also important to convey to employees a sense of the project's urgency. At Cigna, according to Assistant Vice President Donald Falkenstine, "technology is seen as a major enabler, [and] re-engineering is seen as a necessary activity." Even so, Kozik recalled one line manager who delivered the message bluntly, telling the staff of an ailing business unit, "We can look at it in one of two ways: We can all be without a job tomorrow, or half of us can be without a job tomorrow."

—A.E. Alter

nior business management, they can no more act like re-engineering czars than can CIOs. "Ultimately," he said, "business managers . . . need to draw on a cadre of internal re-engineering experts to provide them with technique and objectivity."

In Hammer's view, re-engineering projects require both insiders and outsiders. "The insiders contribute expertise, intuition and credibility; the outsiders provide technique, objectivity and creativity. The leadership comes from the senior insiders.

I think IS should position itself to play that outsider role, that role of re-engineering consultant."

Collins agreed: "It helps to have an outside view to say, 'this is possible,' to give you a process, and to give you somebody to hate while you get this going."

However, there is no textbook answer to the question of how to divide the leadership of the re-engineering team between IS and business management; companies are too different, and the art of re-engineering is

still too new. Nor has the book been written on how to actually carry out re-engineering. To say that IS should be the center of expertise assumes there is a body of knowledge about re-engineering to be an expert in. Ironically, while re-engineering calls for a methodical, structured approach to planning and implementation, there is as yet no sure-fire re-engineering methodology. Although there are re-engineering success stories, "we can't say whether anyone

When one of Cigna's business areas is re-engineered, a few members of the re-engineering unit lead the effort. They are joined by businesspeople from that line of business, the IS application development staff who normally serve it and several consultants.

has a reliably repeatable successful process," Hammer said.

So, at this time, the way every re-engineering effort is led and accomplished is very different, and so too is the role of IS in it.

Consider the ways companies have solved the problem of how to lead the re-engineering team. At Maynard, Mass.-based Digital Equipment Corp., where the finance department undertook its own re-engineering drive, then-assistant corporate controller Bruce J. Ryan (now vice president and corporate controller) led the team. "We did this with a task force of four people: myself, two senior fi-



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nance people and a senior IS manager who was responsible for financial systems."

At Hallmark, after the need for radical change was impressed upon the entire company by senior management, each department assigned staff members known for being innovators and change agents to various "action teams." Each team focused on so-called leverage points—"important things the company must do to get to where it wants to be"—that upper managers had identified. At Hallmark, said Collins, the IS members of these action teams are considered equal partners with the other team members.

Moderson's team examined "the overall strategies of the bank, the major functions delivering that strategy, how those functions interact to provide services to customers and the critical information that must be shared to deliver products and services."

—Ruth Bruch Moderson

But in some companies, IS is formally leading the process. At Cigna and at Continental Bank, the re-engineering planning teams clearly fell within the purview of the CIO. At Continental, CIO John L. Gigerich put Moderson, an IS and financial executive recruited from outside the bank, in charge of the strategic planning team for the project. Her team included IS staff members and repre-

sentatives from many of the bank's business areas, including global trading and distribution and corporate and private banking. However, Moderson described her role at the planning stage as that of a facilitator. Only when the time comes to plan and implement technology does IS take on a more direct leadership role, she said.

At Cigna, a 12-member systems re-engineering unit was formally organized and chartered to serve as the company's re-engineering experts. The unit was placed within Caron's computer systems division, and Kozik, Caron's appointee to head the unit, was given the formal title of assistant vice president of re-engineering. "Since re-engineering is located in the IS function, it is seen as an IS intervention in the business function," said Falkenstine.

According to Falkenstine, the unit's members are IS professionals "with a track record of systems analysis and innovative thinking, and business people with a track record of understanding and implementing the potential of IS in the business." The unit also includes Falkenstine, Cigna's in-house expert on the "human dimensions and change-management" aspects of systems development. According to Kozik, outside consultants from Symmetrix, a Burlington, Mass., consulting firm, bring the total staff size of the unit up to around 30 people.

When one of Cigna's 12 business areas is targeted for re-engineering, a few members of the unit are assigned to lead the effort. They are joined by business people from that line of business, the IS application development staff who normally serve it and several Symmetrix consultants. Kozik thinks of this as a "cross-disciplinary team" of people who specialize in that business segment's marketing strategy, internal operations and information systems.

THE SAME DIVERSITY THAT marks the question of leadership also marks the matter of methodology. There are two things the above companies have in common:

Re-Engineering the Global Organization

Tupperware International has coordinated its worldwide activities so that it now operates "as a global company instead of as a United Nations"

At Tupperware International, the Orlando, Fla., manufacturer of household storage containers, re-engineering has taken a global twist.

Prior to 1989, each of Tupperware's four international units operated independently, with its own manufacturing, distribution, marketing and sales operations, according to Richard A. Duchaine, Tupperware's director of information technology and international administration. But in 1989, Tupperware executives decided the firm needed to work "as a global company instead of as a United Nations," Duchaine said. With a goal of prevent-

They all divide their efforts into various planning and implementation stages, and they keep the planning phase short—usually about six months—to keep planners from studying the problem to death.

According to Collins, Hallmark has completed three phases of its re-engineering effort and has two more to go. "The Journey," as the process is known, began with a preparatory phase, where senior management impressed upon the entire company that both radical and incremental change were necessary, even though the company was successful. In the next stage, Hallmark's top 40 managers developed a "clear, easy-to-ar-

ing shortages in high-growth local markets while operating more efficiently, Tupperware sought to coordinate its global manufacturing and distribution capabilities—but without losing the benefits of local control over local markets.

Duchaine had been trying to educate executives about the capabilities of distributed processing and networking. These efforts paid off when Tupperware's top executives asked him to apply IT to help global-



DUCHAINE: not the United Nations

ize the company. The planning was carried out by IS representatives from all four international areas who were flown together monthly. Business managers from the four areas served on a steering committee.

As a result, Tupperware is now setting up a global manufacturing and distribution system that will act as a de facto "global executive information system." It will track demand, inventory, available manufacturing capability and local manufacturing costs around the world. The system will also be able to evaluate the cost, both in money and time, of shipping the molds used to make Tupperware products to factories around the world. The backbone of this system is a global EDI network, running on a GEISCO (General Electric Information Services Co.) public data network.

Local opposition to the plan exists, Duchaine acknowledged. Local managers "could see themselves losing some of their independent power." But opposition is being overcome by top executive support and creation of an international IT committee, which seeks a balance between local autonomy and global standards.

Two factors have helped to minimize political problems: "making sure we were communicating regularly with regular folks" through the steering committee, and the system's ability to lower local costs and ensure adequate supply of popular products.

—A.E. Alter

ticulate vision of the ideal state for the company" and identified the leverage points needed to get there. Next came the redesign phase, where the action teams were created. "This is where you articulate your objectives and deliverables, where you are going to go and what implementation has to look like." The IT strategy "flows out of all these leverage points" as an enabler of the vision. The next phase, Collins continued, is to come up with the future enterprise model and a migration strategy. The final step is implementation. IS will play a leadership role in this phase when technological expertise is crucial, such as in the installa-

tion of a network.

At Continental Bank, Moderson's team launched an effort to create a new information technology architecture that would be in synch with the bank's new business strategy. Her team began by examining "the overall strategies of the bank, the major functions delivering that strategy, how those functions interact with one another to provide services to our customers and the critical information which needs to be shared to deliver those products and services," said Moderson. Once they created a model of the enterprise that laid out the critical linkages required across the business units, the team devel-

oped a new technology strategy. Key pieces included establishing a technology platform, formulating a design for the corporation's shared databases and creating an application de-

"For once in your life, you are not selling systems; you've got everyone using IT for advancing the business. It's an enormous educational opportunity to get top management to understand the role technology plays in making them successful."

—John Collins

velopment plan based on building modules of renewable code. That effort took six months of work, ending in November 1989. This year, since winning approval for the plan from the CEO, Gigerich has introduced new software development approaches to his IS organization, including computer-aided software engineering (CASE) tools, to enable his organization to carry out this plan.

At Cigna, re-engineering is carried out not as a single, grand corporate-wide program, but as a series of efforts within individual lines of business. The precursor to Cigna's re-engineering effort had been a business-by-business analysis of how technology and information were used in its 12 lines of business. Since committing to re-engineering, only Cigna's group and individual life re-insurance business has been re-engineered, but re-engineering projects



JOHN COLLINS (front) and Hallmark's re-engineering group: *The CIO can't do it alone.*

are underway in five other business areas. According to Falkenstine, the company's methodology includes a feasibility study, a business analysis to identify the potential benefits of change, and actual implementation. At each stage, the commitment by company management to implement the change is reviewed. The systems re-engineering unit will not re-engineer unless invited in by the business's executives—and will only accept the job if it is feasible, will have adequate support within the department, and, said Kozik, "they are really interested in doing some soul-searching, not just cutting expenses." Even if the systems re-engineering unit accepts, it may re-engineer just one aspect of that business line, such as a particular department or function, rather than the entire business.

As promising as re-engineering sounds, it still should not be regard-

ed as some kind of ultimate, sure-fire solution to a company's business problems. There has been little experience yet with re-engineering techniques. It is still a new concept; relatively few companies have undertaken it, and its procedures are still far from refined or proven. While companies have reported that re-engineering has saved both time and money, it is too early to say whether the re-engineered processes will work in the long run.

Moreover, according to Shoshana Zuboff, a Harvard Business School professor and author of *In the Age of the Smart Machine*, the notion that business processes are "engineered" can be a misleading metaphor when it is applied to people. "We have chronically underestimated and failed to manage the human and organizational dimensions of using IT," she said. In streamlined organizations, employees at all levels need an environment that

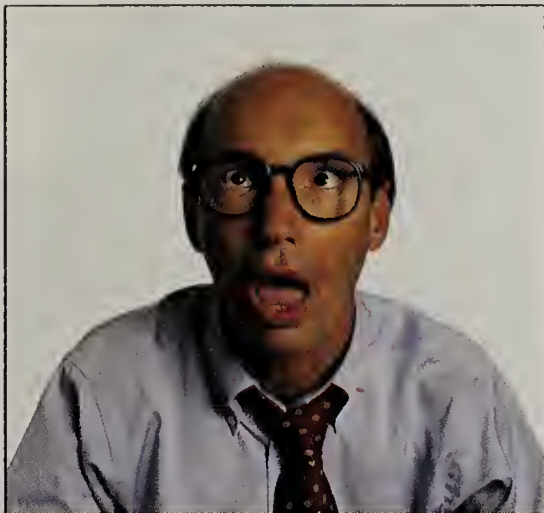
fosters learning and provides them with the skills they need to work with information. While the radical change resulting from a re-engineering process can be very valuable, what the term "signals to us is that this is still merely a technical problem."

Caveats aside, re-engineering appears to be an enormous opportunity for CIOs and IS. "For once in your life," said Collins, "you are not selling systems; you've got everyone using IT for advancing the business, which is what you always want. It's an enormous educational opportunity to get top management to understand the role technology plays in making them successful." At a time when much of the traditional IS role is evaporating, said Hammer, "the demand for re-engineering is exploding." In the future, he added, the IS organization will be the "corporate re-engineers, [and] CIO should stand for chief innovation officer." 

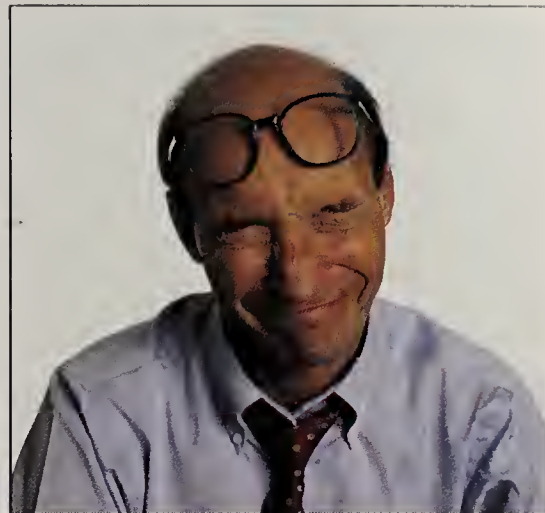
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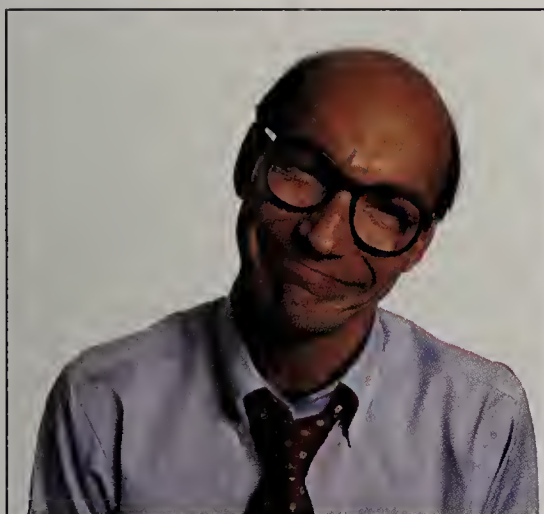
"Hello Mike? What does hard disk failure mean anyway?"



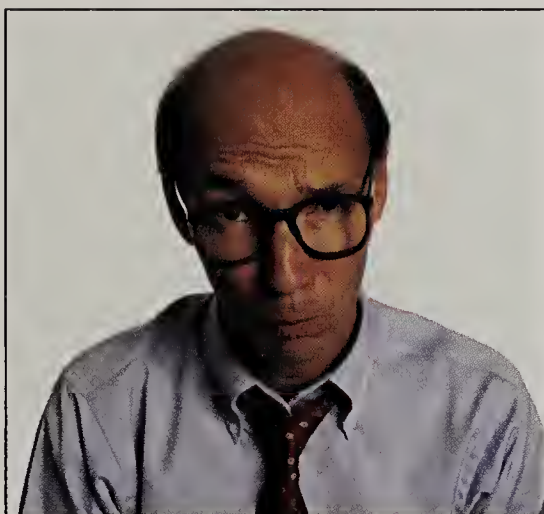
"Mike, we're spending a fortune on these PCs—where is all this money going?!"



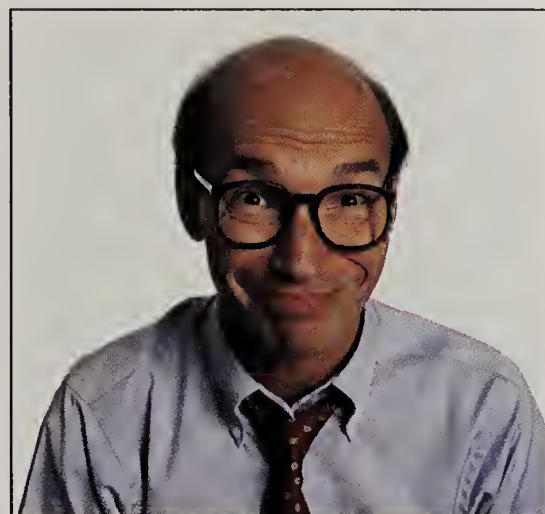
"Hi Mike, can you help me? I can't get on the network."



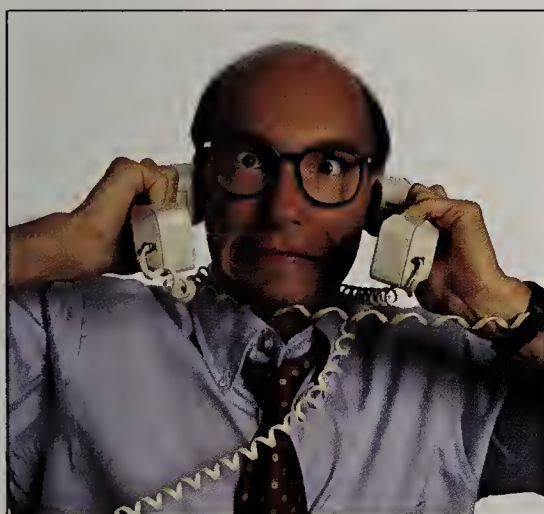
"I have some questions about this DOS stuff. Gotta minute?"



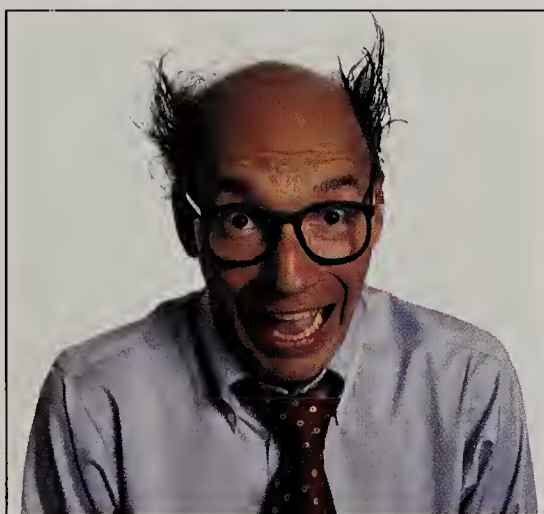
"Quick Mike, I desperately need a color monitor for a big presentation to our CEO!!"



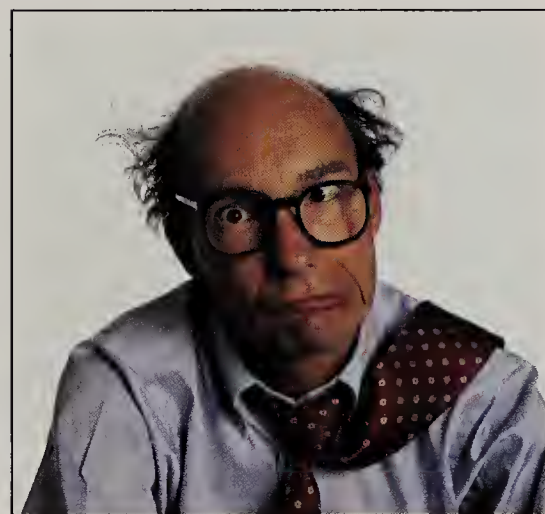
"Hello Mike, sorry, I forgot my password. Again."



"How come they got it and we didn't get it, huh Mike? What's the deal?"



"Mike, I'd like a summary of exactly what you and your people do all day on my desk by noon tomorrow."



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American business is facing a crisis, but it isn't in the boardroom; it's in the schoolroom. Twenty-five percent of American kids drop out of high school. Many of those who finish have below-average reading, communication and math skills, especially in poor and inner-city areas. A decreasing number of high school graduates continue on to college, and of those who do, fewer are seeking careers in teaching, math and science. In addition, schools today must deal with a vast array of social problems: among them abject poverty, drug abuse, homelessness and illiteracy.

As the education system founders, the business world is changing. Technology in the workplace has raised general skill requirements and placed greater emphasis on communication and literacy. Businesses are expecting shortages of qualified workers within the next two decades.

Faced with this forecast, American companies are getting involved in education through partnerships with schools, offering a wide range of help, from providing money, equipment and expertise to supplying curriculum guidance, real-life context for careers and role models for students. The National Alliance of Business

Part philanthropy and part prudent investment in the future, businesses are pitching in to help schools confront the worsening educational climate

BY MEGHAN O'LEARY

reported 140,000 partnerships between businesses and educators this year.

The partnerships cut a broad swath through the needs of the nation's schools. Lotus Development Corp. of Cambridge, Mass., provides technical expertise and funding to

"What the business community has been telling us is that they are concerned about the readiness of kids . . . for initial job entry."

—Marsha Levine

help foreign-born children in Cambridge public schools learn English and develop communication skills in their own languages.

Mattel Toys of Hawthorne, Calif., has donated IBM's Writing To Read labs to five public schools in Los Angeles and will add 10 more schools each year. While any child will be able to use the labs, this partnership is designed to help special-needs students learn reading and communication skills.

Digital Equipment Corp. of Maynard, Mass., offers financial and professional support to any of its engineers who want to switch careers and go into teaching.

IBM Corp. of Armonk, N.Y., recently donated \$1.7 million worth of computers, software and training to Memphis City Schools' Free the Children program, an education and social-service initiative designed to help poor families break the cycle of poverty.

While their efforts spring in part from philanthropy, most companies freely admit that they are equally motivated by the specter of a shrinking labor pool. "What the business com-

Beyond Nintendo

Kids take to computers with ease and enthusiasm.
So it's too bad PCs aren't used more widely
and with more imagination.

Computers have long been touted by vendors and educators as the ultimate learning tool. But for all of the educational promise that technology holds, the fact remains that computers are vastly underused in the classroom environment, commonly relegated to remedial learning labs and often used to perpetuate rote memorization and regurgitation learning.

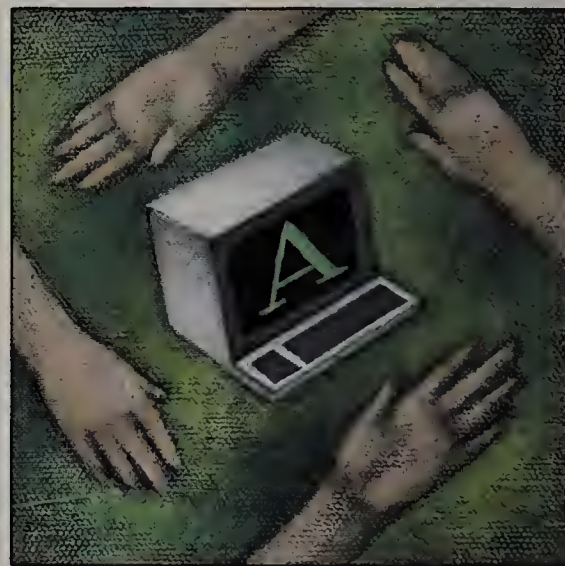
Although some educators rightly complain that many children spend too much time playing Nintendo and not enough time reading, the ubiquitousness of computers in popular culture is a good case for bringing them into the classroom. According to John Sage, senior vice president of administration for Mattel Toys in Hawthorne, Calif., kids today take to technology so readily and are so intrigued by it that, "the normal classroom has got to be boring in comparison."

From the most elemental standpoint, computers belong in the classroom because, in the real world, people learn by using tools, according to Marsha Levine, associate director of educational issues for the American Federation of Teachers in Washington. "In schools we tend to demand that everything be done cognitively, and hands-on is reserved only for slow-track and vocational education, which is absurd." Computers can "bring together the hands and the head."

In effecting that combination, many teachers are looking toward multimedia computing, which uses text, images, sound and interactive exercises to engage the student in the learning process. By some estimates, the average person retains from 30 to 40 percent of what he or she reads or hears, but may remember as much as 70 percent of an interactive lesson that he or she reads, sees and hears. In addition, there is a large body of evidence to suggest that people learn in different ways: Some are cognitively oriented, while others are visually oriented. Moreover, some children learn more slowly than others. Computers can let them learn at their own pace and help them build self-esteem more readily than traditional curriculums.

Levine suggests that computers can not only help students learn subjects through interactive, multisensory experiences, but can let the students "teach" the subjects to others via presentations that involve such elements as graphics, videos and electronic research. Such projects teach children how to do research, solve problems and analyze information. According to Levine, the difference is that students are using the knowledge rather than merely regurgitating it.

"In the Information Age," said Sandra Bateman, public relations manager for K-12 education for Apple Computer Inc. in Cupertino, Calif., "it's going to be [a question of] how easily you can get in and find information when you need it, not how much you've memorized." —M. O'Leary



munity has been telling us [through its involvement] is that they are concerned about the readiness of kids coming out of schools for initial job entry [and] the ability of young people to continue to learn," said Marsha Levine, Ph.D., associate director of educational issues for the American Federation of Teachers and co-director of the AFT's Center for Restructuring Schools.

Partnerships address the dichotomy between what goes on in schools and what is required in the real world. Traditional classroom lecturing—the passive learning model—generally doesn't inspire or even involve kids in learning. Recitation, memorization and regurgitation are the rule rather than the exception. Communication and creativity are not generally rewarded. Moreover, businesspeople complain that children aren't learning critical thinking and that they don't know how to work in groups, communicate effectively or approach problems creatively. In short, they aren't prepared to meet the emerging challenges of business.

"Increasingly we find that . . . no one individual can understand a whole project," explained Mark Conway, manager of Digital Equipment's Educational Investment Review Board. "People are invariably working in teams. What they need are interpersonal skills [and the ability] to work as a team member, break up tasks, [and] synthesize a variety of information."

"I expect schools to deliver people well-versed in the ways of learning," added Bernard R. Gifford, Ph.D., vice president of education at Apple Computer Inc. in Cupertino, Calif. "We need people who are comfortable with the new, with going beyond the information given—people who can invent problems. [Today's students] tend to fall short in going beyond the information given. It's endemic to our school system, the product of the way we teach and the way we reward."

For many schools, partnerships begin in the classroom through donations of equipment and money. Lotus recently donated \$50,000 to Cam-

bridge Public Schools to support the development of projects that demonstrate how technology can be used to teach more effectively. Lotus is particularly interested in combating discrimination by giving equal learning opportunities to non-English-speaking and special-needs students. Ac-

*Businesspeople
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cording to Michael Durney, director of philanthropy, such funding can spur experimentation and educational breakthroughs that school committees can evaluate before committing scarce public funds.

Another active donor is Apple Computer, which has given countless Apple IIs and Macintoshes to schools since it started its grant program 12 years ago. One such grant of equipment and a program called HOTS (Higher Order Thinking Skills), given to the Libby Elementary School in Oceanside, Calif., helps fourth-through-sixth graders develop problem-solving skills, motivation and self-confidence.

Other efforts are aimed at school reform. Rainier Beach High School in Seattle started a teaching academy last year with help from the University of Washington and an \$800,000 grant from The Boeing Co. The academy's curriculum will focus on the interdisciplinary aspects of math and science and the use of technology as a teaching tool, according to Carver Gayton, Boeing's corporate

director of training and education relations.

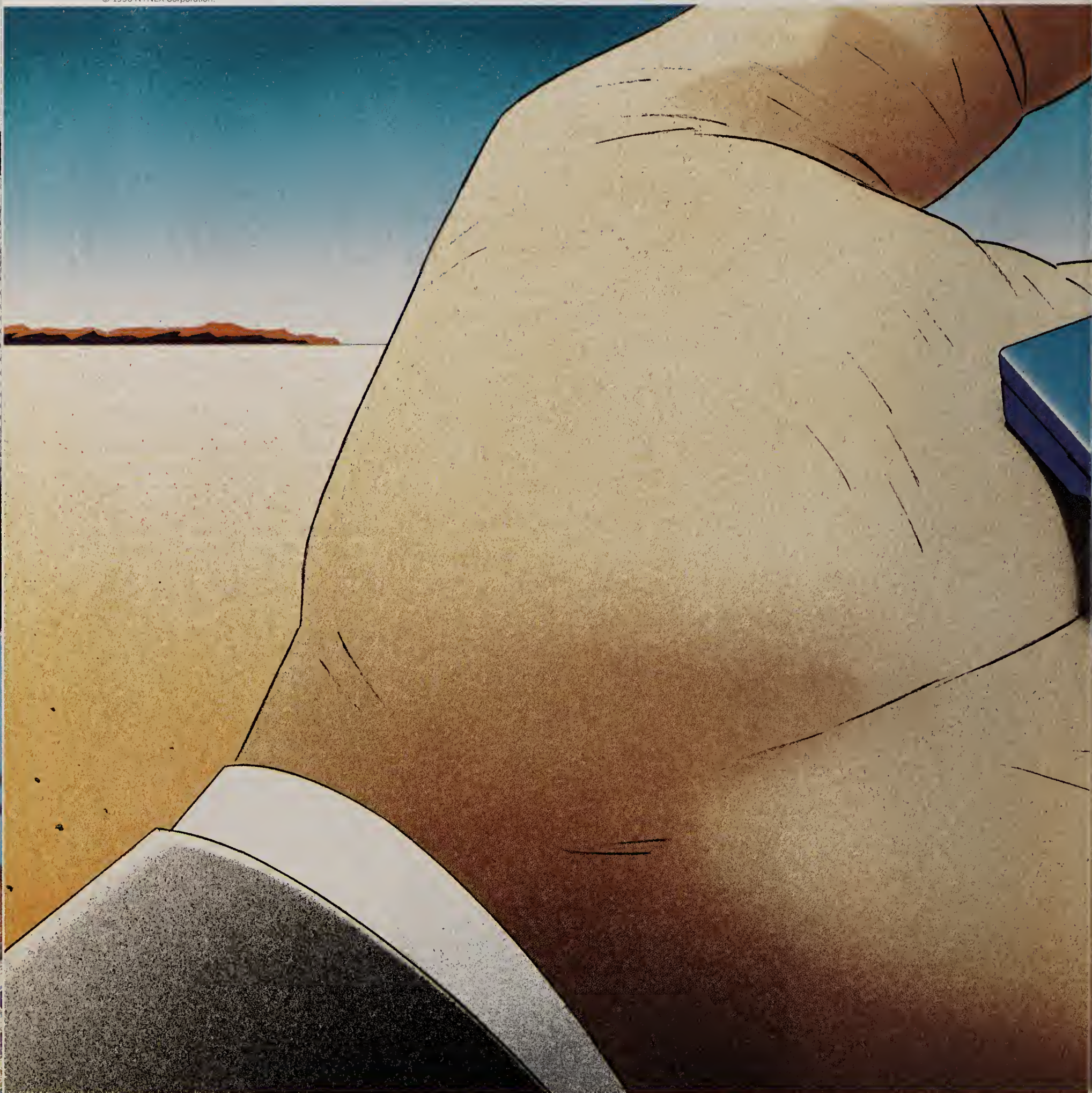
After almost a year of operation, teachers at the academy report lower dropout rates and fewer fights among students. In addition, freshman enrollment at the school has increased for the first time in years. The project's success has won it a \$600,000 grant from the U.S. Department of Education.

The increase in enrollment at Rainier Beach is evidence that a good example can inspire students. For this reason, many programs are directed specifically at creating role models and mentoring children. "You've got kids who don't have a role model who may not even think of college as a possibility, and they're not going to prepare for it," said Phyllis S. McGrath, manager of the pre-college program at the General Electric Foundation in Fairfield, Conn. The Foundation makes grants to poor and inner-city schools and recruits adult mentors for students as part of its College Bound program.

At Aiken High School in Cincinnati, every student in the school's preparedness program has a GE mentor to help him or her make decisions about majors, financial options and possible careers. The difference a mentor can make shows in the program's success: In 1985, only 1 percent—three students in 300—of the senior class went on to college. In 1990, 30 percent—73 out of 240 were college-bound.

A United Negro College Fund/Citigroup Fellows partnership likewise offers African-American college students mentors, advisers and advocates to help them make the decisions that will keep them in school.

"I prefer to describe [mentoring] as putting an emphasis on the need for learning to be accompanied by meaningful relationships," said the American Federation of Teachers' Levine. "I would argue that without meaningful personal relationships, learning is very hard to achieve; that the kind of anonymity that kids typically experience in inner-city schools today is antithetical to learning. One needs to feel part of a community



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Another way to expose students to role models is to send the role models into classrooms. Digital Equipment offers encouragement and financial support to its engineers who want to go into teaching. "I think there is a lack of excitement around the fields [of science and math]," said Bert Goodrich, manager of the Engineers into Education program. "It's very hard to explain to kids what engineers do. If you look at TV, . . . they basically never see any kind of role model for somebody who works in engineering and science."

Some companies offer students a taste of the real world. AT&T Bell Laboratories in Short Hills, N.J., gives minority high school students

"We need people who are comfortable with . . . going beyond the information given—people who can invent problems. [Today's students] tend to fall short in going beyond the information given. It's endemic. . . ."

—Bernard R. Gifford

the chance each summer to work alongside professional engineers in the lab on projects ranging from fiber optics to mechanical engineering. According to Jose R. Acevedo, equal opportunity/affirmative action manager of pre-recruitment for Bell Labs, the internship program is not just for "the cream of the crop." Interns are chosen based on teacher recommendations and personal interviews, not just on grades or test scores alone. "I know of one student last year whose grades were not good at all," Acevedo recalled, "and he was a star [intern]."

Peer pressure being what it is, some business and education partners choose to highlight role models among students. Tandy Corp.'s

The New 'New Math'

.....
A computer-modeling course teaches students how to perform meaningful research and how to learn from and appreciate complexity

Paul Dye is a math teacher. Or at least, "that's the theory," he says. But Dye is more than that to the Sunnyside School District's (Tucson, Ariz.) Systems Thinking Club. He's a teacher of relationships: how food intake relates to weight gain; how peer pressure can make a teenager join a gang. By teaching students about relationships, Dye is also teaching them decision-making skills that will serve them beyond the schoolroom.

Dye's students learn by building models of things they know something about. The STC uses a modeling program called STELLA (Structural Thinking Experimental



Learning Laboratory with Animation), and has benefitted from a money grant from the Educational Testing Service and a donation of 15 Macintoshes from Apple.

Dye described the project his students would be working on that afternoon—a model showing the relationship between eating and weight gain. "My thought is to ask them . . . what happens to people later in life with regard to body weight. I think they're going to say that people's weight tends to go up over the years. And I'll say, 'What is going on here? Let's build a model of what's happening.'"

In Dye's view, the research that students do for their models is more meaningful than research

done for its own sake because it occurs as part of a larger objective. "No one is saying, 'This is going to be on a test,' and they're the only one who's going to judge," he said. "They say, 'I'm satisfied,' or, 'I'm not satisfied with this.' And that's critical if they're going to be successful in their lives. Even thinking about where to go for that information, they're learning."

Dye's students have achieved some notoriety among Apple users for a model they built dealing with the reasons that kids get into street gangs and how—or whether—they can get themselves out again. Sharing the dais with the likes of John Sculley (one of four presenters), six of Dye's students presented the model at Apple's National Urban Education Conference this year. Dye points proudly to his students' understanding of the fact that knowledge is provisional: "They prefaced everything with, 'Our understanding of it is. . . .'"

"I'm aghast at how much knowledge I used to try to disseminate without having students understand what they were learning," Dye said. "Picture yourself in Algebra 1, and the teacher goes, 'Two trains leave a city. . . .'" There's no understanding."
—M. O'Leary

Tandy Foundation of Fort Worth, Texas, in partnership with Texas Christian University, seeks to motivate students by financially rewarding those who do well in math and science and are involved in academic projects in their communities.

The program, known as the Tandy Technology Scholars program, also awards grants to teachers on the same principle. "We've all become aware of the problem of teacher burnout," said Andrew Miracle, Ph.D., executive director of the pro-

"It's very hard to explain to kids what engineers do. If you look at TV, . . . they basically never see any kind of role model for somebody who works in engineering and science."

—Bert Goodrich

gram and professor of anthropology at TCU, "and we're attempting to recognize those teachers that are special, not only in terms of their disciplines but [for what they] have really contributed . . . to their communities, hoping that they will become role models to other teachers."

Indeed, a growing number of corporate partners see recognition of excellent teachers as one way to publicize educational approaches that work. Through a program called Thanks to Teachers—jointly sponsored by Apple Computer, the National Foundation for the Improvement of Education, The National Alliance of Business and Group W Television—outstanding K-12 teachers are recognized with awards and national publicity.

Although few businesses will go so far as to take responsibility for education, they agree that there is an immediate need for action. The AFT's Levine voices the belief of many businesspeople: "I think that most businesses act out of a sense of enlightened self-interest." Apple's Gifford bristles at the idea of opportunism, however. "Our enlightened self-interest is that we help to insure the future of the nation," he said.

GE's McGrath put it more concretely: "Our view is partly philanthropic, but it's more than that. It's in our own [best] interests to have better-prepared workers, educated consumers and voters, and an educated citizenry. It doesn't disturb me that business is being a part of this. I feel that we have a vested interest and something we can contribute."

Digital's Conway scoffs at the idea of pure philanthropy, especially in light of the \$50 million worth of research, gifts and equipment that the company gives to education each year. "You don't make that level of investment unless there's something in it for you," he said.

Jack McCredie, head of external research programs for Digital, agreed: "If the education system crumbles, we have a shortage on our hands. The stockholders haven't invested in us to run a philanthropy for K-12."

With business pouring millions into education, some critics question the appropriateness of its deep involvement, especially with regard to curriculum development. In a *Wall Street Journal* report on education last February, University of Wisconsin Professor of Education Alex Molnar said outright that the public school system was in danger of being sold to the highest bidder.

Businesspeople and educators seem to agree that such a risk exists, but most insist that as long as businesses are making grants rather than developing the curriculum, students are not in danger of being brainwashed by the free-market system. "I think there could be a danger there in terms of the business community dictating specifically what

Corporate Donations to K-12 and Higher Education

COMPANY	1989	1990
Apple Computer	\$8.5 million*	\$8.5 million*
AT&T	15.3 million	15.3 million
AT&T Foundation	15 million	15 million
Boeing Corp.	6.5 million	7.4 million
Digital Equipment Corp.	50.4 million	46.9 million
General Electric Foundation	14.8 million	15.9 million
IBM	30 million**	30 million**
Lotus Development Corp.	175,000	not available
Mattel Foundation	300,000	500,000–750,000
Tandy Corp.	not available	not available

*averaged over a 12-year period
**average for the two-year period

should be taught in the classroom," Boeing's Gayton said carefully. Still, Gayton believes it is necessary for schools to have an understanding of the needs of the business community. "What we want to be able to do is to build a feeling of trust . . . and talk about the things we can do that aren't going to subvert what you're trying to do in education."

Even businesses that need technically skilled workers see the value of long-term investment in education for education's sake over short-term indoctrination of students. "If you hire all the cream of the crop," said Conway, "you're eating your seed corn, so to speak."

Regardless of the controversy surrounding their role, however, these business leaders are doing something to address the needs of schools around the country. There is no magic bullet for the problem, GE's McGrath said. "You have to choose your piece, and the key [to achieving balance and momentum] is to get as many companies and groups involved [as possible]." ☐



H. EDWARD NYCE: *Facing difficult times, Manufacturers Hanover turned to downsizing and restructuring.*

Decentralization of information technology has worked wonders for organizations in the past 20 years. Here's how one major financial institution has worked even more wonders by reversing that trend.

BRINGING IT BACK HOME

Manufacturers Hanover Trust Co. decided to buck a trend—its own. Having spent a decade and a half decentralizing its information processing facilities and the organization that ran them, the New York-based bank suddenly discovered compelling reasons to pull its systems back together. The main payoff would be, of course, massive cost savings—a welcome achievement even for a bank with \$60 billion in assets and \$3 billion in annual revenues. But the big question facing the bank was whether it could roll its eight data centers back into a single unit without also turning back the clock on the high level of IT-related service that has become so critical to the banking environment. Manufacturers wasn't merely facing the technical challenge of building a mega-data center; it would also have to cope with transforming eight separate data-center management organizations into a single structure while al-

lowing the individual business units to retain a large measure of control over their IT fates.

The bank seems to have met these challenges, having recently completed the better part of a whirlwind consolidation. The final verdict isn't in yet, but so far the bank seems poised to reap significant savings without having to pay a price in IT quality. It's a result that should provide encouragement to CIOs who need to cut costs but don't want to plunge into outsourcing.

The motivation for IT consolidation started to build at Manufacturers about four years ago. The bank had been swept along like everyone else in the great trend to decentralization in the 1970s and early 1980s, when its business units were developing increasingly critical information technology needs—needs that couldn't be met fast enough by a centralized IT organization dealing with a growing backlog and a massive data center

BY DAVID FREEDMAN

PHOTO BY KENT HANSON

CIO Magazine Announces... *Perspectives*SM: Maximizing Profits through Information Technology

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- Aligning Systems and Business Success Factors
- Negotiation Strategies: From Combat to Consensus
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THE MAGAZINE FOR INFORMATION EXECUTIVES



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Perspectives:
**Maximizing Profits
through
Information Technology**

Sunday, March 10 through
Wednesday, March 13, 1991

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Perspectives: Maximizing Profits through Information Technology

The Conference

If responsibility for your company's information systems rests with you...whether your company's business practices are defined by highly documented, automated state-of-the-art systems or haphazard methodologies...*Perspectives: Maximizing Profits through Information Technology* is the one conference for you.

Focusing on managerial effectiveness and improved productivity techniques for widening your profit margins, *Perspectives* is sponsored by *CIO Magazine* and hosted by several select leaders in Information Technology. Featuring an outstanding roster of business champions and technology innovators, the program offers first-hand accounts, insights and perspectives from front-line leaders and thinkers. Plus, you'll have ample opportunity to exchange ideas and opinions with your colleagues.

Fit for Survival

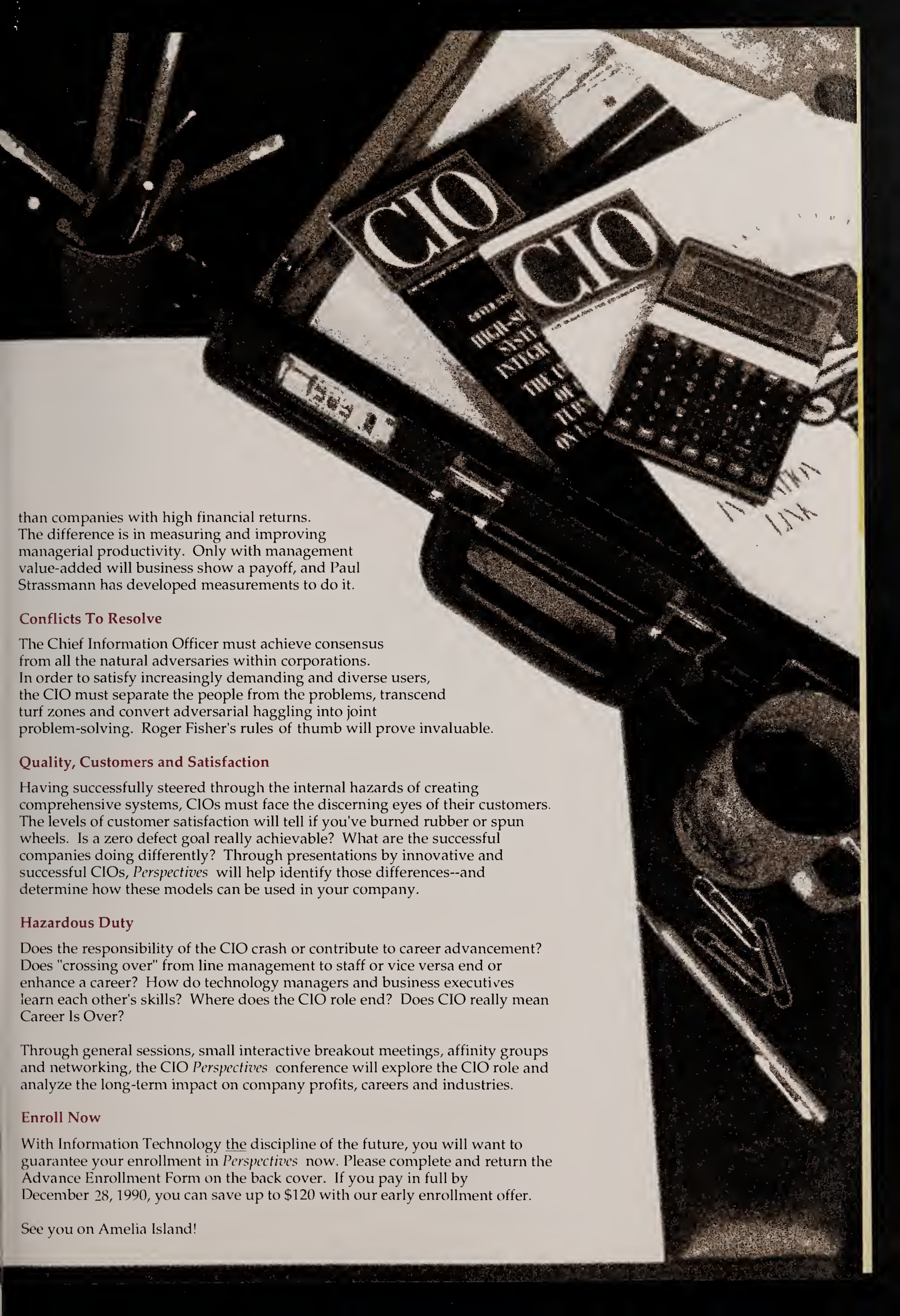
Today's volatile economic environment is unlikely to change soon. While some economists insist recession is upon us, others see expansion driven by a weak dollar and new access to the 500 million prospects in Eastern European markets. What is certain is that only those companies able to respond quickly to the fluctuating business climate will exist tomorrow. And their survival is dependent on today's strategic management of Information Technology.

Critical Success Factors

If your IT plan isn't resolving the issues that keep your CEO awake at night, they're not aligned with your company's critical success factors. Only those companies who have aligned their information systems to their critical strategic goals will stay in business, says John J. Donovan, technology innovator and consultant. This requires tapping the full potential of Information Technology and being absolutely certain that all systems are a crystal reflection of those goals.

Metrics of Success

Measuring and then improving managerial productivity are the keys to knowing how to invest in information technologies; yet, the relationship between IT expenditures and productivity has not been correlated. Systems expenditures have been increasing faster than purchases for any other class of equipment, and unprofitable companies have been spending as much or more



than companies with high financial returns. The difference is in measuring and improving managerial productivity. Only with management value-added will business show a payoff, and Paul Strassmann has developed measurements to do it.

Conflicts To Resolve

The Chief Information Officer must achieve consensus from all the natural adversaries within corporations. In order to satisfy increasingly demanding and diverse users, the CIO must separate the people from the problems, transcend turf zones and convert adversarial haggling into joint problem-solving. Roger Fisher's rules of thumb will prove invaluable.

Quality, Customers and Satisfaction

Having successfully steered through the internal hazards of creating comprehensive systems, CIOs must face the discerning eyes of their customers. The levels of customer satisfaction will tell if you've burned rubber or spun wheels. Is a zero defect goal really achievable? What are the successful companies doing differently? Through presentations by innovative and successful CIOs, *Perspectives* will help identify those differences--and determine how these models can be used in your company.

Hazardous Duty

Does the responsibility of the CIO crash or contribute to career advancement? Does "crossing over" from line management to staff or vice versa end or enhance a career? How do technology managers and business executives learn each other's skills? Where does the CIO role end? Does CIO really mean Career Is Over?

Through general sessions, small interactive breakout meetings, affinity groups and networking, the CIO *Perspectives* conference will explore the CIO role and analyze the long-term impact on company profits, careers and industries.

Enroll Now

With Information Technology the discipline of the future, you will want to guarantee your enrollment in *Perspectives* now. Please complete and return the Advance Enrollment Form on the back cover. If you pay in full by December 28, 1990, you can save up to \$120 with our early enrollment offer.

See you on Amelia Island!

Panelists and Concurrent Session Speakers



Michael Behar
CEO
University
Communications, Inc.



Jeffrey E. Brooks
President
Brooks Associates



Dudley P. Cooke
President
The Executive Insight
Group, Inc.



John J. Donohue
Director
Information Systems
Sun Refining &
Marketing Company

Conference Agenda

Sunday, March 10

- Registration
- Arrival Reception

Monday, March 11

- Registration
- Continental Breakfast

• **Welcome:** Joseph Levy,
President & Publisher, *CIO Magazine*
Opening Remarks & Moderator:
Alan R. Fusfeld, President & CEO,
Generics North America

• **Fit for Survival: Totally Aligning Systems
with Critical Success Factors**
John J. Donovan, President and CEO,
Cambridge Technology Group

• **Coffee Break**

• **Negotiation Strategies:
Turning Combat into Consensus**
Professor Roger Fisher, Director,
Harvard Negotiation Project

• **Rightsizing: Balancing Capital, Human
Resources and Structure in a Volatile
Economy**

Moderator: Dudley P. Cooke,
President, The Executive Insight Group;
John J. Donohue, Director, Information
Systems, Sun Refining & Marketing Company;
John Gigerich, CIO, Continental Bank of Illinois

• **Luncheon & Presentation: The Coming Year
for Business & the Economy and Its Impact on
You:** Alfred L. Malabre, Jr., Economic News
Editor, *The Wall Street Journal*

Keynote Presenters



Tandon

Graham C. Beachum, Jr.
Vice President & General Manager

PCs and Profitability: Maximizing the Match

Having joined Tandon in April 1990, Graham Beachum heads up the company's North American operations. His extensive experience in computer marketing serves him well in this position, as he brings a customer-oriented perspective to the personal computer business. His career of 20+ years also spans a variety of senior management positions with IBM, Tandy Corporation, Dell Computer Corporation, Wang Laboratories, and Northgate Computer Systems.

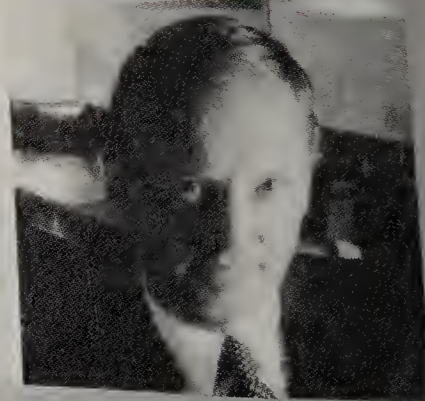


Du Pont Company

Raymond E. Cairns, Jr., PhD.
Senior Vice President, Information Systems

Scope, Not Scale: The Billion Dollar IT Budget

Ray Cairns is responsible for directing Du Pont's global computer and systems functions. In this position he oversees worldwide computer and network operations, data management, and core information systems applications used by individual businesses within the company. Prior to joining Du Pont in 1962, he served as a first lieutenant in the U.S. Air Force and later worked as a research metallurgist for the National Research Corporation in Cambridge, MA.



Cambridge Technology Group

John J. Donovan
President & CEO

Fit for Survival: Aligning Systems with Critical Success Factors

John Donovan has been founder and CEO of four successful companies. He has authored five books, most recently, *Crisis in Technology*, as well as numerous articles. In addition, he is a tenured faculty member on leave from MIT in management and engineering; was a member of the Presidential Advisory Commission on USSR/USA Technology; and was awarded the Tufts Medical School Commendation for outstanding contributions in medicine while a faculty member at Tufts Medical School.



Dick Vitale
Basketball Analyst and
On-Air Sports Personality



Michael J. Watters
Manager, Advanced
Information Management
Texas Instruments



John W. White
President, Information
Technology Group
Texas Instruments

Also participating:

Stuart Smith
Head of Information Systems
Chemicals & Polymers
Division
ICI, Ltd.

Thomas J. Friel
Managing Partner
Information Technology
Practice
Heidrick & Struggles

John R. Wise
Vice President
Marketing Programs
Unisys Corporation

Larry Goodman
General Manager
Information Systems
U.S. Postal Service

Wednesday, March 13

- Continental Breakfast
- Scope, Not Scale:
The Billion Dollar IT Budget
Raymond E. Cairns, Jr., Senior Vice President
Information Systems, Du Pont Company
- Optimizing the Software Development
Process: Strategies for Protecting Investments
While Leveraging New Technologies
Bryan Shepherd
Executive Vice President
Computer Associates International

- Coffee Break
- Myths Versus Reality: Multivendor
Environments in the Glass House
James W. Balassone, Executive Vice President,
Marketing, Hitachi Data Systems
- Managing Change: From the Base Line to the
Bottom Line
Dick Vitale, Basketball Analyst and On-Air
Sports Personality
- Closing Comments



Strassmann, Inc.
Paul A. Strassmann
CEO



Hitachi Data Systems
James W. Balassone
Executive Vice President of Marketing

The Business Value of Computers: Measuring IT's Relationship to Profitability

In his book, *The Business Value of Computers*, Paul Strassmann speaks to executives responsible for information technology. He has also authored some 60 articles on information management and information worker productivity. Before founding his own company, he served as corporate information systems executive for General Foods and Kraft, as well as Xerox's chief information systems executive and vice president of strategic planning. He is currently a member of the Department of Defense Federal Advisory Board for information Management.

Myths Versus Reality: Multivendor Environments in the Glass House

Jim Balassone brings 25 years experience in strategy development, project management, team building and communications skills to his responsibility for the management of worldwide marketing at HDS. His years abroad underscore his understanding of global strategies and balancing domestic and foreign systems integration.

Conference Hosts

AT&T Network Systems offers telecommunications companies everything they need to build and operate their networks worldwide. Products include the world-class digital 5ESS Switch, computerized operations systems, mobile communications switching equipment and digital transmission systems.

Computer Associates International develops, markets and supports a broad range of integrated information management systems, applications and micro software on a worldwide basis, offering over 200 products used by the largest client base of any independent software company.

GTE Spacenet is a world leader in satellite communications, with over two decades experience providing telecommunications services and systems to businesses, news organizations and government agencies across the United States and around the globe. The company provides full-service design, implementation, operation and management of private networks and systems to customers with data, video and voice communications needs.

Hewlett-Packard makes computing and electronic measuring equipment for business, industry, science, engineering, health care and education, with more than 10,000 products including integrated instrument and computer systems.

Tandon Corporation has over 15 years experience and 16 patents in the computer and peripherals business. Tandon designs, develops, manufactures, markets, services & supports its full line of computer products, which are sold worldwide. Tandon computers are marketed in North America through national account sales representatives, Tandon Business Partners (resellers) and toll-free direct telephone sales.

Texas Instruments is one of the world's leading electronics engineering companies. Its Computer Aided Software Engineering (CASE) product, Information Engineering Facility (IEF), is one of the fastest growing businesses of TI's Information Technology Group.



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All enrollment fees must be paid in advance of the meeting. Fee includes conference materials and scheduled food and beverage. Transportation and hotel are the responsibility of the participant. We reserve the right to limit the number of participants.

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All enrollment fees must be paid in advance of the meeting. Government/Military fee includes conference materials, scheduled food and beverage, AND standard hotel room at Amelia Island Plantation for the nights of March 10, 11 and 12. Transportation is the responsibility of the participant.

CONFERENCE ATTIRE

Since it is our intent to create an informal, relaxed setting throughout the conference, casual attire is strongly suggested. Florida evenings can be cool, so we recommend that you bring a sweater or jacket.

CANCELLATION

You may cancel your enrollment up to 30 days prior to the conference and receive a full refund. For cancellations made between 29 and 11 days prior to the conference there will be a \$400 charge. If you cancel within 10 days of the conference, no portion of the enrollment fee is refundable. You may, however, apply the entire fee to a future CIO Perspectives conference. All cancellations must be made in writing. Also, it is your responsibility to cancel your hotel accommodations and transportation arrangements.

HOTEL ACCOMMODATIONS

A block of rooms has been reserved for conference participants. We urge you to make your reservations as soon as possible with Amelia Island Plantation directly at 800-874-6878. Be sure you identify yourself as part of the CIO Perspectives conference in order to receive the conference rate. Room reservations and hotel charges, including non-scheduled food and beverage, are your responsibility.

Arrival/Departure Times

Please indicate your arrival and departure plans below:

Arriving on: _____ Friday, March 8
 _____ Saturday, March 9
 _____ Sunday, March 10
 Departing on: _____ Tuesday, March 12
 _____ Wednesday, March 13
 _____ Other (specify date)

SPECIAL REQUIREMENTS

As the majority of meals are included in the conference, please indicate any dietary restrictions.

FLIGHT INFORMATION

American Airlines, Delta Airlines, and Eastern Airlines are the Official Conference Carriers. Depending on your originating city, you can qualify for up to a 55% discount through the special conference fares established. To receive this discount, call: American Airlines Meeting Services Desk at 800-433-1790 and reference STAR File #S11314S; Delta Special Meetings Network at 800-221-1212, Extension 7707, and reference File #B29030; or Eastern Convention Central at 800-325-7597 and reference File #EZ3FP84. U.S. Air and Continental Airlines also serve the Jacksonville area.

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A B C D E F G H I J



THE MANUFACTURERS HANOVER TEAM: (from left to right) Michael Szejnberg, Steven Sheinheit, Robert Burda, H. Edward Nyce and Chris Karadimas are pulling it all together.

becoming more and more difficult to manage. The bank had little choice but to spin off data center responsibilities to the units, allowing each unit to address its own priorities. Eventually, the bank ended up with 11 different data centers. "Each data center was completely self-contained," explained Executive Vice President H. Edward Nyce who has top responsibility for IT at Manufacturers. "It had its own computing equipment, software, operations and support staff, and site. It was a very high-cost situation."

Then, in the mid-1980s, the world changed. Global competition was putting the thumbscrews on U.S. businesses of all types, and banks were no exception. In fact, banks faced a double whammy, because deregulation accelerated the pressure to operate at the lowest possible costs. "Like all money-center banks, we were facing difficult times," recalled

Nyce. "We had to take a number of actions, and the most significant of these was downsizing and restructuring. After a few years of cost-cutting in virtually all areas, I finally asked [the people within IS] what major opportunities presented themselves to significantly reduce expenses within information technology."

The first cost-reduction effort took place in Manufacturers' \$400 million Geoserve division. Spun off as a new unit in 1989, Geoserve is charged with providing the bank's non-credit services, such as cash management, funds transfer and corporate trust. Because Geoserve had been pulled together from different business units, it was operating five different data centers. The decision was made to consolidate these into two.

That project was a complete success, according to Richard Matteis, general manager of Geoserve. "There were a lot of business man-

agers that were concerned about losing control over IT resources," he said. "But we've actually improved our level of services by making everyone at the data centers more client-focused, and we're saving \$12 million a year."

Encouraged by the success, Nyce began to think about the next logical step. "It was clear from the Geoserve experience that significant savings could be made from a bankwide data center consolidation," he said. "We put together a review board and spent most of 1989 assembling a detailed economic case. We were sure the savings were there."

It was also clear that a consolidation had the potential to be a two-edged sword. After all, virtually every component of the bank had come to rely on IT as a critical element of success. Losing any processing capabilities or flexibility could have disastrous repercussions. "We

"Each business unit is in the best position to determine how to meet its particular information technology requirements. We didn't want to change that. We just wanted to take advantage of the fact that processing power is becoming a commodity, and we wanted to develop a single organization to run it as a processing service."

—H. Edward Nyce

had to be sure that we could run a consolidated operation while maintaining service levels," said Nyce.

In addition, Manufacturers' IT organizational structure had over the years been built around an increasingly decentralized environment. Each unit had its own data-center management team that developed its computing styles and priorities. It wasn't immediately clear how these separate teams could be molded together so as to allow for effective management of a single data center without having to ram new ways of operating down any of the units' throats. "Each business unit is in the best position to determine how to meet its particular information technology requirements," said Nyce. "We didn't want to change that. We just wanted to take advantage of the fact that processing power is becoming a commodity, and we wanted to develop a single organization to run it as a processing service."

Finally, the sheer logistical difficulties of a complete consolidation were enough to give management pause. The bank was basically all IBM, but even so, bringing together hardware and software capable of replicating the processing power and multiple operating environments of eight different data centers was a daunting task. It also meant that any problems with downtime might now be felt

across the entire bank, rather than being isolated to a single unit. In fact, the concern over putting all of the bank's processing eggs into one basket had been one of the justifications for decentralizing in the first place.

Despite these potential difficulties, management felt that the potential cost savings were too attractive to

pass up. If the consolidation were handled right, they figured, the problems could be minimized—and maybe even turned to their advantage. One big plus, for example, would be in the area of disaster contingency. Nyce thought that a consolidation would be a perfect opportunity to build a comprehensive backup site, reasoning that a single data center would be a great deal easier to back up than eight separate ones. And having a complete backup site was a goal Nyce had been aiming at ever since a risk analysis performed a few years back revealed that the loss of a major data center could put the bank out of business within two days.

In addition, the bank was convinced that new hardware and software technology could help prevent running into trouble with other aspects of centralization. Mainframes have become so reliable, for example, that it seemed unlikely that bankwide glitches would become a frequent problem. Furthermore,



THE COMPANY went to Wilmington, Del., for its backup site.



THE BACKUP data center, which has all the capabilities of the main center, should be online in a few months.

mainframe operating systems now allow the processing power to be partitioned off into separate operating environments within the same machine, enabling units to continue to run their own software independently as they had in the past. "Today it's possible to have your cake and eat it, too," said IT Senior Vice President Steven Sheinheit. "You achieve centralized economies of scale but keep applications looking as if they're decentralized. Eventually you can help everyone gradually migrate to common environments."

In February 1990, the bank gave the green light for a crash consolidation. The goals were formidable: merge eight data centers into one plus a backup site over a period of just 10 months, achieving an annual cost savings of \$20 million to \$30 million on an up front investment of \$10 million.

The first step was to set up a "project office" to plan and manage the consolidation. The office would be run by a dozen top IT managers from both the corporate IT organization and the individual units. In addition to overseeing the consolidation, the project office would also act as a transitional management team for the consolidated data centers while the bank worked through the complex chore of setting up a more permanently restructured organization. "The dilemma we faced was that the

organization couldn't possibly restructure itself as fast as this project was going to move," explained Sheinheit, who headed the consolidation. By temporarily embodying this new management structure until the actual management team could take over, "the project office acted as a surrogate to organizational change."

The project office's first task was to put together more than a dozen "focus teams"—cross-divisional working groups charged with planning a particular element of the consolidation. One team handled capacity planning, for example, while another concentrated on network architecture and a third dealt with facilities design. The key to the focus teams' success, according to con-

mas, who is responsible for overseeing both the new data center and the backup site. "People had a sense of being on an elite force, and really rose to the occasion."

While the focus teams went to work on the details, senior bank management went to work on the vendors. The decision had already been made to purchase all new equipment. "We felt [that] starting off with a clean slate would give us a leg up," said Sheinheit. Purchasing all new equipment for two giant data centers at a major bank added up to potential sales large enough to get any vendor to snap to attention—and Manufacturers knew it. What's more, the bank was going to play this situation for all it was worth. "For the first time, we were aggregating our purchasing power," noted Karadimas. "When you're decentralized, you're divided and conquered from a purchasing point of view."

As the focus teams hammered out the hardware requirements, the project office prepared requests

"There were a lot of business managers that were concerned about losing control over IT resources. But we've actually improved our level of services by making everyone at the data centers more client-focused, and we're saving \$12 million a year."

—Richard Matteis

solidation project managers, was instilling them with a sense of the importance of the mission to the organization—a sense that would cut across the more parochial concerns of the individual business units from which the different team members came. "It was apparent to everyone that top management was giving this project the highest priority," said Senior Vice President Christ Karadi-

for quotes that ultimately went out to IBM Corp., Amdahl Corp., Hitachi America Ltd., Comdisco Inc. and others. The bank gave the vendors only two weeks to reply. Every vendor met the deadline.

Nyce and other senior bank managers then held meetings with the vendors' senior managers, during which Manufacturers was able to knock down prices to the lowest possible

A row of mailboxes, likely in a post office, with international flags and labels. The word 'JAPAN' is visible on one mailbox, and 'ENGLAND' is visible on another. The scene is dimly lit, with a warm, golden light source creating a soft glow and long shadows.

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levels and win commitments for fast delivery and high levels of service. "We were getting the absolute best out of these vendors," said Sheinheit.

The bank ended up dividing its purchases among the vendors, with IBM winning the lion's share of the mainframe end. In fact, IBM was so eager to get the sale that it agreed to make Manufacturers one of the handful of customers to receive a 390-720 mainframe the day before the new machine was actually announced. "We didn't even have to twist their arm," said Vice President Michael Szejnberg, who is overseeing new technology for the consolidation. Szejnberg added that he had some hesitations about going with an unproven processor until IBM did a little arm-twisting of its own. "Their higher-ups were able to convince us

it was safe technology," he said.

Meanwhile, the two sites were being prepared at breakneck speed. The main site, located in Manhattan, had been home to the bank's corporate data center. For backup, the bank decided to go to Wilmington, Del. "We felt we had to have one site out of the New York area," explained Sheinheit. "The New York infrastructure is just too fragile."

Preparing the sites was a major challenge, not only because of the massive amount of equipment to be installed in a fantastically short time frame, but also because much of the preparation had to be carried out before the teams actually knew which equipment was going to be purchased. "Our business is changing so fast, we don't know where we'll be in three years, anyway," said Vice

President Robert Burda, who helped plan and coordinate the consolidation. "We didn't want to have to rebuild anything, so we set it up to handle almost any kind of hardware."

Remarkably, the bank was ready to bring the Manhattan site online in November, only nine months after the entire project began. "I had predicted that the best case would be bringing the data center up by January, and the worst case by December of next year," said Sheinheit. "I'm pretty happy to say we beat the best case." The Wilmington site is scheduled to come online within a few months. Meanwhile, the project office has already relinquished control to the new data-center management structure.

What's next for Manufacturers? The only big step the bank could take at this point in the hopes of further reducing costs would be to go to outsourcing. Nyce isn't ruling that out, but he insists it's not something the bank is considering at this point. "There is nothing in our program right now to pursue any kind of outsourcing," he said. "We'd want to make sure we've done everything possible to get a handle on our own costs before we'd look at that."

Further IT cost reduction is a goal that even the bank's most senior managers are pushing for. "We have to face the fact that many elements of financial services have significantly too much capacity, and that has to be rationalized," said Vice Chairman Edward Miller. "We need to get a better sense of priorities when it comes to application development, and to make sure that our development efforts are closely tied to the corporate strategies."

But Miller is also keenly aware of the risks of imprudent IT cost-cutting, and notes that the goals of the consolidation also included improved IT responsiveness and better contingency. "We have to maintain a tremendous sense of balance," he said. So far, Manufacturers hasn't shown any signs of stumbling. ☐

David Freedman is a freelance writer based in Brookline, Mass.

TECHNICAL PROFILE

Manufacturers Hanover Trust Co. is the eighth-largest bank in the United States, with 20,000 employees, assets of more than \$60 billion and annual revenues of more than \$3 billion. (Last year the bank posted a loss of about \$500 million, largely due to its setting aside nearly \$1.5 billion to cover possible credit losses.) Manufacturers operates 221 retail banking branches in the United States alone and offers a full range of commercial banking services. The company has an annual IT budget of \$415 million and an IT staff of 2,600 people. It is currently implementing a significant consolidation of its major data centers expected to trim some \$30 million off its annual IT expenditures without downgrading service.

Large and mid-range systems: Manufacturers currently operates four main data centers in the United States (down from eight before the consolidation effort began), three of which are running one or two IBM 308X or 3090 B or E mainframes. The fourth—the bank's completely revamped central data center in New York—went online in November and runs IBM's new 390-720. By next year, all sites except for the central data center will be closed, and a full backup site in Wilmington, Del.,

will go online. Both sites will run a single IBM 390-900 apiece, IBM's biggest mainframe so far (and as yet unreleased). The data centers will also employ IBM and Hitachi Data Systems disk storage, and IBM and Storage Technology tape drives. An independent data center in London operates an IBM 3084 mainframe, and a handful of other, smaller data centers in Europe run AS/400s and System/36s.

End-user computing: The bank's end-user computing is completely decentralized, with no central coordination.

Software: Mainframe operating environments include MVS/ESA, MVS/XA, CICS, JES2 and JES3, with DB2, IMS and IDMS databases. Over the next few years, the bank will be migrating most MVS/XA applications to MVS/ESA. The new backup site will be operated remotely, in large part via Legent Corp.'s Automate software.

Networking: The bank employs multiple T1 backbone connections with six major nodes linking more than 6,000 3270 terminals at nearly 300 bank branches, mostly via SNA. A gateway hooks a smaller international network into the main network.

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CIO MAGAZINE

EXPERT

Companies with hands-on experience using expert systems have learned that the technology keeps its promises—as long as it's put to work solving the right problems in the right way

BY PAUL KONSTADT



MARSHA BLACKMAN: *Incorporating more than one expert's knowledge can create an overly exacting system.*

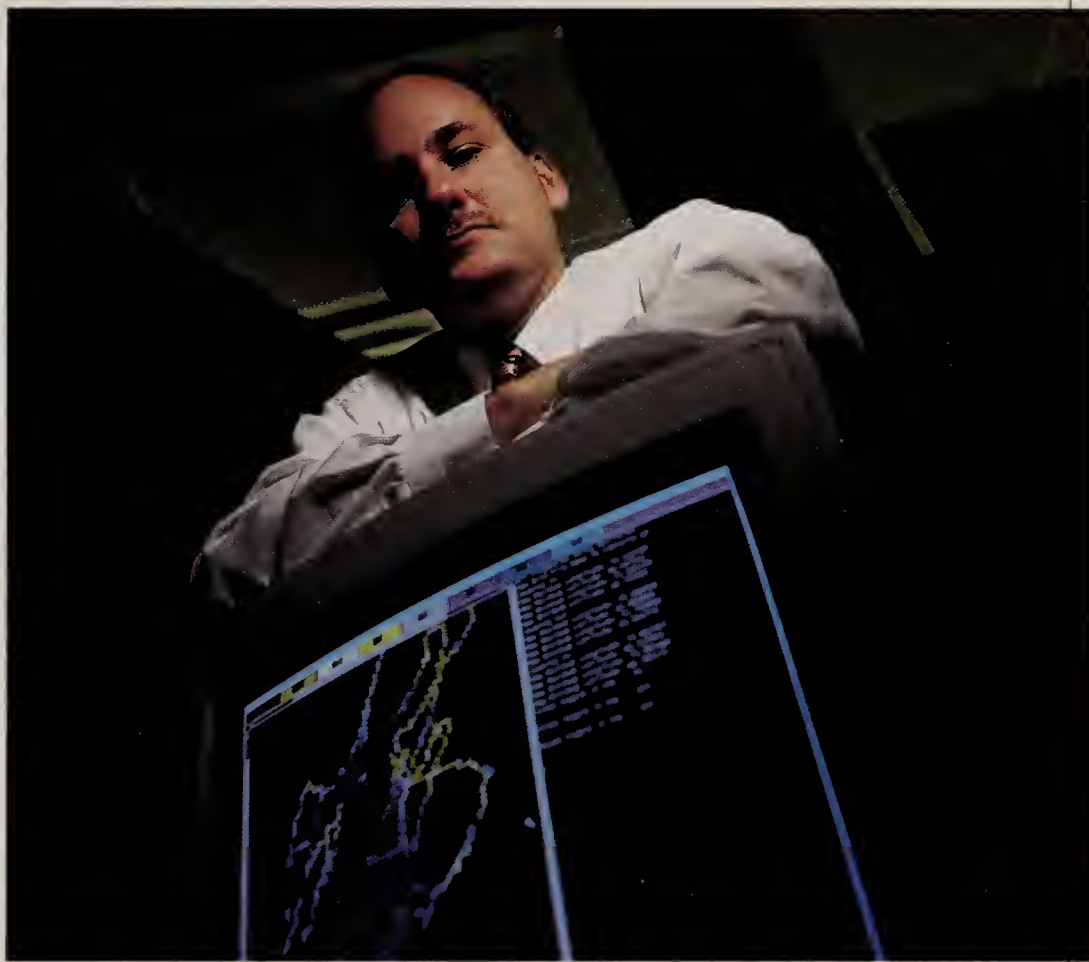
OPINION

EXPERT SYSTEMS can be worth their weight in code, say information executives who have used the technology to unburden such stubborn and costly business operations as financial analysis, insurance underwriting and process troubleshooting. Over the past two years, thousands of expert systems have been put into production in mainstream information processing environments. These are workaday applications that are invoked as casually as word processors, spreadsheets and databases.

Expert—or what some theoreticians prefer to call knowledge-based—systems frequently represent investments so small compared to the improvements they bring about that their payback periods have been measured in terms of months or less. But often, the gains come with indirect costs. Sometimes, those who design or implement the systems first have to resolve debate over ambiguous terminology or settle political disputes among users. In other cases, they have to become organizational surgeons, reconstructing the ways users do their jobs.

The first round of business experiments with artificial intelligence took place nearly a decade ago, using exotic, hard-to-integrate platforms that required a high degree of extremely specialized expertise to operate. Moreover, early applications focused on high-level business conundrums that often proved intractable—an approach that stalled the spread of the technology. The latest wave of interest, by contrast, has set its sights lower, on what Randall Davis, associate director of the AI Lab of the Cambridge, Mass.-based Massachusetts Institute of Technology called “chewable” problems.

“The important insight that [business users] had,” said Davis, “and which was not immediately obvious from the academic research, was to create modest-sized systems



JIM EUCHNER: *Integration with an organization's work processes is critical.*

for modest-sized problems. There was an enormous amount to be gained by the judicious use of a [knowledge] base of modest size.”

The gains reported to date are impressive: more efficient production processes, more cost-effective and consistent analysis of financial risks, improved service delivery and reliability, and more effective utilization of high-overhead equipment.

TOPPING THE LIST of benefits gleaned from the hands-on experience of expert systems is that they actually do deliver anticipated productivity benefits. Take the mainframe-based batch-screening system built by Marsha Blackman, second vice president at Transamerica Occidental Life of Los Angeles. Many large insurance companies have codified in expert systems the empirical rules used by their most effec-

tive underwriters to decide which applicants to accept and which to reject, based on likely risk. Blackman's system approves applications for insurance covering children and healthy young adults based on the data that has been entered in the corporate mainframe. (What it cannot automatically approve, it flags for further ac-

Expert systems frequently represent investments so small compared to the improvements they bring about that their payback periods have been measured in terms of months or less.

tion.) It then sends completed policies to the approved applicants, substantially reducing the need to have expensive professional labor handling straightforward transactions. As a result, said Blackman, the firm now has "the same number of underwriters doing many more



ED MAHLER: the threat of change

cases."

And at New York Life Insurance Co., a PC-based underwriting expert system automatically approves some 40 percent of the individual policies the company writes, according to Gail MacLean, New York Life's application project director. There's nothing shy and retiring about this kind of expert system—underwriting is the make-or-break of insurance decision-making. At both Transamerica Occidental and New York Life, these are mission-critical applications. Said MacLean: "If you don't have a good underwriting program, if you make poor decisions so you are paying out more than you take in, then you'll be in trouble."

Other kinds of approval processes are showing similarly dramatic benefits. Dun & Bradstreet's Credit Clearing House, located in Basking Ridge, N.J., uses an expert system to provide opinions on the credit-worthiness of clothing retailers to D&B subscribers in the apparel trade (clothing manufacturers and importers). The expert system recommends a credit limit that the subscriber can safely extend to a given client. In most instances, according to Roger Jambor, assistant vice president for customer technology at the D&B unit, the system calculates the limit without human involvement. "It is in effect handling 89 percent of the cases automatically," said Jambor.

In 10 percent of the cases, the year-old expert system concludes on its own that the situation is complex enough to call for human review. In the remaining 1 percent, there is not enough current background information in the database to make a credit decision. Most of the subscribers access the credit-worthiness system by dialing in online, so machine-set credit lines are indiscernible from those decided by human experts.

But it's not enough to simply shift the decision-making burden from human to machine. A key requirement for successful implementation is to establish the accuracy and reliability of expert systems. Testing them against human experts accomplishes



ART ZAEGEL: Getting the railroad's system back on track

this for developers while also reassuring novice users that the systems can indeed be trusted. At D&B, precision testing of the credit-line application yielded a 97.5 percent rate of agreement with the analysts whose expertise is modeled in the program. "The other 2.5 percent was because the analysts couldn't agree what the rules should be," said Jambor.

Even expert systems that don't actually make key decisions can improve the productivity of the people who do. At Diners Club International, Citicorp's business charge-card unit, an expert system frees analysts from having to do the preliminary calculations that are the basis for approving new corporate credit-card accounts. According to Mark Zenk, director of corporate technology at Diners Club's Denver operations center, the expert system plows through these calculations "twice as fast" as the manual process it replaced. "More of those analysts' time is now going to where it's really needed." The ultimate benefit, said



is a matter of semantics.

Zenk, is "reduced turnaround time to the customer."

But perhaps the most wondrous kind of productivity gain is achieved when an expert system prevents humans from wasting time and money doing utterly unnecessary work. At NYNEX Corp. operating units, for example, an expert system has reduced the number of false-alarm field excursions that service technicians have to make by more than 6 percent (see related story). The system works by evaluating the electrical characteristics of residential telephone circuits that have been reported to be malfunctioning. It then tries to determine in what portion of the telephone network the trouble lies. "It translates into a savings of several millions of dollars a year on erroneous dispatches," said Jim Euchner, director of expert systems at NYNEX Science and Technology Corp., of White Plains, N.Y., which developed the system for NYNEX's New York Telephone Co. and New England Telephone Co. subsidiaries.

In all, Euchner added, the system cost "less than a million dollars" to develop, including five man-years of work time "and lots of testing."

One stunning illustration of the bottom-line potential of expert systems can be seen in applications that Harrison, N.Y.-based Texaco Inc. uses to keep refinery processes from running amok. Those tongues of fire that sometimes leap from factory smokestacks are telltale signs of a malfunction requiring that excess chemicals be burned off for safety reasons. Such fires are also a sign of "dollars going up the stack," in the words of Bill Braden, a senior technician in Texaco's information technology department. Texaco has implemented an array of expert systems that monitor processes and issue alerts in the earliest stages of malfunction, before conditions reach the point of requiring smokestacks to be flared. Although Braden declined to reveal the precise value of the chemicals his expert systems have saved from burning, he did say that in one case Texaco recovered "a sizable percent of the cost of the system" after it had been in operation for two days.

THE FLIP SIDE of these promising examples is that in each case, before they could deliver the benefits, they had to be stitched into their respective organizations. Expert-system veterans usually describe the process of creating and installing a basic application with such expressions as "straightforward" or "painting-by-the-numbers." That, they say, is because of the simplicity of many widely available expert-system design tools. Much more complex, however, are the organizational and cultural issues raised by the introduction of what in many organizations is a dramatically different way of processing information.

"Implementation is a change process," declared Ed Mahler, manager of decision support and artificial intelligence systems for E.I. du Pont de Nemours & Co. of Wilmington, Del. Mahler has, by his own estimate, overseen the installation of 950 sys-

tems throughout the company. "You are asking people to change how they conduct their work, and you have to build a process to manage that change." Expert systems, Mahler added, "are more threatening than most technologies because they are the first computer programs to enter the domain of decision-making."

There are many ways in which such a subjective conflict can play out

"Implementation is a change process. You are asking people to change how they conduct their work, and you have to build a process to manage that change."

—Ed Mahler

in an organization. At Diners Club, in the course of developing the expert system used in approving new accounts, Zenk's IS unit also created a standardized reporting format for the analysts to use in presenting the statistical and narrative portions of their analyses. "The credit officers found [that the new format] encroached on their personal styles," said Zenk. And that, in turn, bred resentment of the system. "What ended up happening was that during the prototyping stage, when we expected to be fleshing out the analytical flaws, we really ended up spending more time fleshing out the flaws in the presentation of information . . . and building consensus."

Other organizational adjustment issues have proven to be less problematic. Users have found that expert systems excel not at unraveling complex difficulties, but at performing routine decision-making tasks with speed and precision. Insurance com-

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JIM WELLBORN, a du Pont research associate, is an enthusiastic convert.

panies typically use their expert systems to identify and approve the clear-cut cases—applications from healthy, young, non-smoking office workers who live in safe, middle-class neighborhoods, for example. In the process, they have found that underwriters who were bored by such simple puzzles perked up when they were freed of them. “Our senior personnel can now deal with just the interesting cases. Their days are now a little bit brighter,” said New York Life’s MacLean.

The analysts at Dun & Bradstreet’s Credit Clearing House experienced a similar sense of liberation, said Jambor. “People were able to exercise their art on the most complex cases once we removed the clerical functions they had been forced to perform on a daily basis.” So powerful was the attraction of the system, so willing to accept it were the analysts, that Jambor said he was “shocked. . . . Nobody notices [the system] now; it’s like it’s been there for a hundred years, like it never was any other way.”

Even at Diners Club, the automation of routine analysis proved to be a boon for the credit analysts, once the

design hurdles were cleared. “They don’t need to do all those repetitive operations just to prepare their spreadsheets,” Zenk said. “Their focus now is more on making the right decision.”

NOT ALL the work-load transfers are from human to machine; sometimes the expert system forces a shift from one work group to another. That was the case at Transamerica, where the implementation of the expert system demanded that additional information be keypunched from the application into the database. While the company didn’t have to add more input clerks, Blackman said, in order to accept the added burden, current workers “had to be helped to realize that it was a benefit to the company.”

Another type of organizational difficulty emerged at the Burlington Northern Railroad Co. based in St. Paul, Minn. The obstacle was so substantial that it has stalled the implementation of what was to have been a pioneering train-scheduling system. The problem the system was designed to address is central to the company’s operations: How can dis-

patchers move the greatest number of trains in the least amount of time over the shortest available routes, while also allowing for track maintenance?

Scheduling is a complicated task. For one thing, many contracts with shippers now provide severe penalties for even small delays. Moreover, work on the rails is performed by expensive equipment staffed by large,

“Nobody notices [the system] now; it’s like it’s been there for a hundred years, like it never was any other way.”

—Roger Jambor

highly paid work crews that cannot function unless all traffic on the particular line is suspended. “I don’t think we foresaw how complicated this problem really would be,” said Glenn Galen, manager of AI systems. “When you delay a train or delay a track-maintenance gang, somebody is going to be inconvenienced.”

Unlike most rules in the typical expert system, the rules that resolve this maintenance-versus-operations conflict will be the result of explicit policy decisions made by the highest levels of Burlington Northern management. It is Galen’s belief that as more expert-systems development pushes closer to the core of an organization’s business practice, more developers will have to embed politically established rules into their systems. “When an expert system helps automate a critical function,” he said, “it can’t be done in a vacuum. Building it becomes a process that involves key decision-makers.”

While expert-systems development kits try to make the implementation process as smooth as possible, most

Some businesses are so dependent on their communications system that when a disaster suddenly strikes they lose

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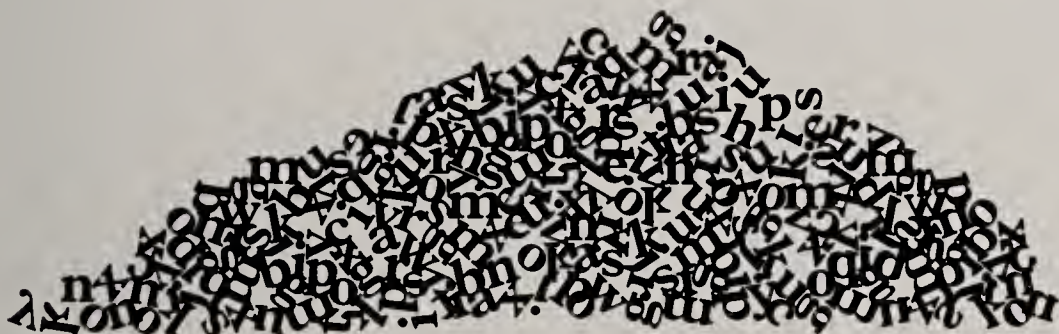
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pioneer developers have run into some kind of pothole along the path to production. At Transamerica, the bump came when developers tried to put too much expertise into the structure. "The most important thing we learned in developing our expert system was to pick one expert and let just that one talk to the knowledge engineer," Blackman said. Transamerica's system was too particular. "No two underwriters think exactly alike," said Blackman, and each balances the risks of a particular application a little differently. By combining the rules followed by a number of underwriters, Blackman created a system that found fault with nearly every application it evaluated.

When Burlington Northern ran into difficulty with one of its systems, the problem turned out to be a matter of semantics. Art Zaegel, corporate

counsel to the railroad, served as the expert model for a system designed to warn the company's salespeople if the joint deals they worked out with other railroads would run afoul of federal antitrust rules. That is a particular worry for the major rail carriers who might cooperate in one environment while competing elsewhere.

In modeling the system, Zaegel used what he thought was a universally understood railroad term: interline. It turned out that a significant number of the people on whom he tested the software had no idea what the term meant, rendering the "expert" ineffective. "Going into this I had no idea . . . that it would take so much time to work out the ambiguities, [but] you have to make sure all users interpret critical terms the same way," he said.

Whether providing legal advice on an obscure point of law, guiding the

operations of an intricate chemical reactor or deciding the fate of a million-dollar business deal, expert systems are succeeding most often when they are clearly tied to functions that are important to their users. "Integration with the way an organization does its work is a critical success factor," said NYNEX's Euchner. "You've got to tie in to both their systems and their methods." Or in Roger Jambor's words, "You'd better have a damned good business justification and not a technical one."

But even with that caution, noted MIT's Davis, the horizons for knowledge-based technology in modern business are almost limitless, because virtually every area of business activity calls for some kind of expertise that can be machine-modeled. "There is no such thing as the right answer," he said. "You match the tools to the task." ☐

Lord of the Rings

.....
An expert system named MAX helps NYNEX keep its telephone-repair technicians from going on needless missions

New York Telephone Co. Service Manager Louis Spina fondly remembers the good old days at the NYNEX Corp. subsidiary when mechanical switching equipment was tended continually by trained technicians who could pinpoint malfunctions at any stage with ease. While the electronic switches that now run the network are more efficient and reliable, the newer technology's greater size and scope has created far more complex diagnostic headaches for Spina's technical cadres.

Until now, that is. Spina's East Brooklyn, N.Y., maintenance depot is one of 42 in the six-state NYNEX service region that uses the services of MAX, NYNEX's Maintenance Administrator Expert system. MAX analyzes the data from a standard battery of network tests to determine the location of faults reported by customers. It has been filtering the trouble reports coming into Spina's shop since August 1989, and overall, Spina said, it has saved a lot of chasing around for the staff. "They know where to go with the report now, [so average trouble-] clearing time became much quicker."

In addition, the vast bulk of false reports are detected by MAX's analysis, so now, Spina said, "we're putting techs out only on troubles that are truly trouble, rather than wasting time."

MAX has also given Spina a handle on the problems caused by the non-standard telephones and peripheral devices used by some customers. Things like fax and answering machines can draw too much

power from the network or actually feed some of their own power back into telephone circuits. Either way, identifying and solving the problem was a complex process of elimination before MAX. "Back in the old days, if we saw [a positive power reading] on the line, we knew that there was some kind of cross" between power and signal circuits, Spina said. "But in today's world, it could be anything, and one of the big things with MAX is that we're finding these things up front."

In fact, it was an encounter with a customer's errant answering machine that first taught Spina to trust MAX. The circuit's test readings seemed to point to a malfunction that blocked the ring signal from reaching the customer's phone. Instead, at MAX's behest, the customer was told to unplug the answering machine; as a result, the circuit again worked properly. The trouble was resolved with a telephone conversation, saving a costly and time-consuming field-service call. "I found that extremely interesting," said Spina. —P. Konstadt



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Repairing the CIO

The chief executive confronting a troubled IS function might do well to think twice before conducting a purge

BY WILLIAM N. HARRIS AND
SUSAN K. BEHNKE

One seldom-asked question lurking within the oft-discussed CIO turnover problem is whether CEOs frustrated with IS performance are throwing the rascals out without first giving due consideration to a less drastic and potentially more promising alternative: engineering an IS turnaround from the inside.

It's important to emphasize that not all—and perhaps not even a great many—situations will profit from an “inside job,” but under the right circumstances there's a lot to be gained from a vote of confidence in the incumbent regime.

One key component of a successful inside turnaround of IS is an enlightened CEO who is capable of judging both the magnitude of the problem

and the willingness of the CIO and senior IS management to respond to executive guidance. When the CEO takes on this challenge, his first weapon against the forces of IS disintegration is knowledge. His assessment of the situation should include the nature of the CEO himself; the status and roles of his company's IS organization; a comparison of his own IS department with those at other companies; and his company's IS track record with regard to all major undertakings.

The CEO must also determine that the CIO is not already fatally wounded. If, for example, the CIO is a member of the executive committee, the CEO could well be mistaken in believing that the situation can be salvaged with the present CIO. Why? If the CIO were truly competent or a good enough “fit” with other top managers, the CEO would not have had to go through the exercise of investigating the magnitude of IS problems; he would already know. And if the CIO was not the person who initiated discussions about IS direction, the CEO may have real difficulty in securing his or her cooperation. After all, this CIO is being second-guessed and may show a natural tendency to respond defensively to being circumvented.

However, let's assume that a CEO suffering through IS problems has determined that his IS management is capable of being salvaged, provided the current CIO will respond to executive management guidance.

One way of assuring that the CIO will be an effective collaborator in the turnaround process is to make him or her a member of the executive management team. This avoids isolating—and alienating—the CIO and the IS group by making them an explicit part of the solution to the problem. It also sends a signal to the IS



ILLUSTRATION BY FRED LYNCH

function as a whole that it is seriously valued and that it has both a central role to play in the company's operations and a responsibility for future success. Finally, bringing the CIO onto the executive council holds out visible reassurance that the interests of the IS group will be well and fairly represented in carrying out the turnaround.

If the CEO believes that promoting the incumbent CIO to the executive-management team is incompatible with the role of IS at the company, he deprives himself of the ultimate CIO carrot. However, it is still an option to promote the CIO within limits judged to be appropriate. If the CIO is not officially called "CIO," it costs nothing to award the symbolic title, which can also be interpreted as a gesture that confers enhanced esteem upon the function.

Once the CIO's collaboration in an IS turnaround has been assured, where does the rebuilding process begin? As a practical matter, any situation in which an entire corporate function is singled out for rehabilitation will be rife with political land mines. One way to begin defusing these sensitivities might be to involve IS in a broad, corporatewide movement toward strengthened vertical and horizontal communication. This could be a productivity-centered program for all employees, but particularly for key individuals who are able to lead performance improvements within their departments.

Such a program is a natural step for any service-oriented company to take, and it is even more natural if IS is an integral part of operations. This step then becomes a substantive way of involving the CIO in group decision-making; of widening the CIO's sphere of responsibility (as a principal in fashioning interdepartmental programs to upgrade user IS skills and speed the IS department's missionary pulse); and, perhaps most pointedly, of drawing the CIO into tactical and strategic discussions that could prepare the way for eventually bringing in a consultant to help orchestrate the turnaround. The consultant's work then could be conceived as a

part of the push toward a more proactive company in all spheres of activity.

Besides offering a way of jump-starting an IS turnaround, these kinds of employee-centered productivity programs—best typified by such companies as Federal Express, 3M, Springfield Remanufacturing Corp. and W.L. Gore & Associates, all of which have concentrated great energy on developing their corporate cultures—create entirely new organizational structures through which to communicate goals to employees and inspire their best efforts.

As a practical matter, any situation in which an entire corporate function is singled out for rehabilitation will be rife with political land mines.

An assumption underlying the prescription of such a program is that the management of information systems can no longer be separated from other areas of management. Especially in companies that seek an open, candid, creative and responsive management, with individuals who are equally open, candid, creative and responsive, IS planning will be most effective if it is integrated with other management productivity-, motivation- and morale-building programs. In fact, management would be remiss not to take advantage of IS's potential for furthering desired changes in company culture.

It is no accident to suggest that a program to broaden vertical and horizontal communication should precede the hiring of a consultant. The decision to hire a consultant can, at worst, add considerable volatility

to the mix, and will at least provoke suspicion. The downside can include:

Staff resentment. The CIO and other highly placed IS personnel can feel that top management is shoving a solution down their throats. Resentments can develop between IS people and consultants. (At one Fortune 200 processing/wholesaling conglomerate, the CIO, distressed over the hiring of a consultant to review his planning efforts, resisted several attempts by the consultant to help calm the working relationship between the CIO and his superior. Failure to work harmoniously with his superior ultimately cost the CIO's job.)

Lost CIO credibility. The CIO may be perceived by IS staff to have lost senior management's confidence; in this case, the CIO suffers diminished credibility as a leader within, and high departmental turnover may follow. (Needless to say, the CIO's damaged aura will alter relationships within the department, and this can lead to conflicts and exacerbate hard feelings. Any event that radically changes the way people relate to each other in the work environment can lead to conflicts and raw nerves.)

Lost professional clout. IS department employees, especially those with some authority, may feel that much of their power and influence has been (or will be) stolen from them by the consultants. At a Fortune 50 consumer products company, for instance, employees interpreted the presence of consultants as a threat to their chances to manage important projects.

Despite these perceived risks, a consultant can offer a great many benefits. Consultants bring a broad perspective that includes wisdom gleaned from the demonstrated successes of other clients with comparable organizations and problems. Moreover, distance from the local political fray affords the consultant the credibility either to refute or validate findings by the in-house IS management team with respect to needs and solutions. Consultants can therefore often be handy in swaying votes toward proposals that might otherwise sink under the weight of perceived vested interests.

A well-traveled consultant also has the ability to offer advice on whether specific strategic objectives can be achieved through existing information technology, and if any current products will work better than what is at hand, to suggest which technology will work best.

On a symbolic—but still very real—level, a consultant can have the effect of making IS personnel feel wanted. Although senior management is clearly unhappy with current performance, the IS group should nonetheless get the message that the company is committed to having an effective and aggressive function. They may view the use of consultants to assess departmental strengths and weaknesses as a first step toward upgrading the organization. For example, at both a Fortune 100 consumer products company and a Fortune 200 processing/wholesaling conglomerate, consultants were hired to assist in turnaround efforts.

IS employees in each company considered the use of consultants to be a demonstration of corporate support for the IS department. They perceived the expenditure for consultants as proof of their company's dedication to sound IS planning and program development.

Bringing in a consultant can actually lead a troubled IS group to feel it is being rescued. The group also may interpret the hiring of a consultant as an attempt by senior management to save top IS management and minimize the trauma and turmoil of change. As noted above, the consultant can also provide an important seconding vote. The IS management team, including the CIO, may regard the consultant as a source of leverage in their hitherto unsuccessful attempts to sell executive management on needed systems or programs.

Finally, some IS employees may even look upon working with a consultant as an opportunity to learn, to grow and to lay the groundwork for furthering their careers.

In addition to bringing in a consultant, there are other ways to shore up the IS function with extra decision-support guidance. Moni-

toring committees, for example, are fairly common devices top management can use to backstop IS leadership. To be effective, however, such committees have to do more than rubber-stamp the plans and activities of the IS chief. They are there to offer concrete guidance. But leadership in setting IS direction has to come from the top. Only senior executives who are involved in strategy-setting and who understand the true needs of executive management and the various company functions can pro-

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work environment can
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vide appropriate IS guidance. Middle-management committees more often than not become bogged down in petty politics and minor interests.

If the IS problem is more the result of an overburdened or under-skilled staff than of a slipshod decision-making process, the solution might lie in a radical reorganization and downsizing of IS by hiring a facilities-management company to take on some or all of the management and operation of the IS function. This move can be a way for the company to upgrade IS management and technical ability quickly through a massive, instantaneous infusion of new talent. An outsourcing pact could

even be implemented on an interim basis to give the company breathing room in which to upgrade in-house skills and systems. The facilities-management company could then play a role in jump-starting development of new systems and applications, helping to bring new skills to in-house staff.

The chief drawback to hiring a facilities-management firm is that the arrangement could, in effect, annul the company's remaining IS organization, traumatizing valued employees. Those who remain will see little opportunity for career growth, anticipating that the firm will infiltrate the ranks with its own managers and specialists. They are also likely to interpret the outsourcer's presence as a clear statement by the company of its indifference to any significant IS development. In short, they will feel devalued in the eyes of top management.

These kinds of potential pitfalls will have to be addressed before the decision is made to hire a facilities-management firm. To anticipate and contain possible damage, contractual parameters for the management company's sphere of activity will have to be carefully defined, especially pertaining to the roles the company's own IS employees will play in the reorganized IS component and to the facilities-management firm's development role. These are the minimum steps needed to reassure IS personnel that they are not unwanted.

The effort to salvage an incumbent IS department is an endeavor that is certain to be fraught with peril. None of the foregoing suggestions is easy to employ, and each risks undermining morale in the IS department and producing a rise in departmental turnover. But given the significant turmoil that accompanies a changing of the guard at the CIO level, an inside turnaround is an alternative that at least deserves serious attention. ☐

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The Year in Review

An index of all major articles published in CIO in 1990, including a cross-reference by article type

Articles are numbered in sequence from the first issue of CIO. (See last December's issue for a guide to stories published prior to January 1990.) To help readers find articles of interest, we've added a cross-reference by categories at the end of the listing. For example, readers interested in industry overviews would look up the articles numbered 198 and 245.

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303. "Toward Asset-Based IT" (Page 18)—an Insights column that looks at companies' IT investment-justification practices. By Anthony P. DiRomualdo

304. "Organizational Revisionism" (Page 20)—an Outlook column reveals that re-engineering is a top IS priority. By James Champy

305. "Repairing the CIO" (Page 74)—a Human Factors column on CEO options when confronting a troubled IS function. By William N. Harris and Susan K. Behnke

306. "The Year in Review" (Page 80)—an index of all major articles published in CIO in 1990

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EVENTS

Using LANs as a Strategic Technology

Radisson Hotel Clayton, St. Louis
January 14 & 15
Holiday Inn City Center, Chicago
January 17 & 18
Association for Systems
Management
216 243-6900

Using LAN technology to address business issues is the focus of this conference. Topics discussed include enterprise networking, network standards, basic system design, network administration, network management and vendor roles and responsibilities. There is also an overview of network operating systems, vendors and products. Registration fees: \$570 for members; \$645 for nonmembers.

Network Computing Forum and Exposition

The Grand Hyatt Hotel,
Washington
January 28-31
World Expo Corp.
508 820-8126

The conference focuses on the distinct needs of senior managers implementing large enterprise information systems. Products from 13 com-

panies are featured along with educational workshops and technical conferences. Key topics include managing the migration to new software environments, centralized management of network computing, partnering of vendors and users and a five-year forecast for network computing applications. Registration fee: \$1,095.

NCGA '91: Conference & Exposition

McCormick Place North, Chicago
April 22-25
National Computer Graphics
Association
703 698-9600

Computer graphics applications is the focus of this conference. Technologies discussed include business graphics, cooperative processing environments, integrating graphics and video, multimedia, CAD/CAM/CAE/CIM, electronic publishing and image processing. There are also more than 200 exhibitors and product demonstrations. Registration fees: \$245-\$730 for members; \$295-\$795 for nonmembers.

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